

The Iron Age

INDEX TO
READING MATTER
PAGE 28.

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS.
PAGE 29.

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Tweddell's Portable Hydraulic Riveting Machine.

We illustrate this week a novel and ingenious arrangement of a portable riveting machine and crane on Mr. R. Tweddell's well known system. The machine in question, as described in *Engineering*, forms only a part of a very complete traveling plant designed and manufactured by an English firm, and the arrangement consists of a trolley or carriage, upon which is mounted a crane carrying the riveting machine. By means of a cross gantry the latter is able to be moved in a transverse direction during the time the machine is engaged riveting. The trolley retires as the construction of the structure progresses; the connection with the pressure main is never interrupted, as the flexible pipes and swivel joints allow for any change of position; a hydraulic chain-lift adjusts the position of the machine vertically. On the same trolley is also mounted a reverberatory rivet-heating furnace, which enables a considerable quantity of rivets to be always ready. The portable riveting machine has a gap of 42 inches, and is capable of closing rivets of 1 inch diameter.

The riveting machine, as shown, is in the proper position for riveting up the floor-plates of bridges; it is, however, obvious that the machine can be used with a lever, vertically or horizontally or at any intermediate angle. In addition to the crane and riveter illustrated, a motive-power trolley is supplied, on which is fixed the steam engine, boiler, accumulator and the pumps. Supplied from this same power trolley are also other travelers carrying spare riveters for different parts of the girders. The object of thus subdividing the plant is, of course, to minimize as much as possible the load to be carried by the girders during construction; otherwise the principle is the same as that used by Mr. Tweddell in conjunction with Messrs. Fielding and Platt, of Gloucester, the builders many years ago on similar work in England.

METALLURGICAL NOTES.

A New Method for the Extraction of Selenium.

The following is the translation of an article written by M. P. Kienlen, which was published in *Bulletin de la Société Chimique de Paris*:

The increased demand for selenium in connection with the microphone and similar inventions makes the discovery of a new supply of this substance a most important one. It is well known that selenium, which is one of those elements so seldom found in nature, is not directly extracted from the natural selenides which in minute quantities accompany the sulphides found in certain districts, but, rather, it is isolated from various secondary products of industrial chemistry in which this metalloid accumulates. Among the products which the technical works make special mention of are the dust from the roasting of selenium minerals in metallurgical establishments, and the deposits which are formed in the lead chambers of sulphuric acid factories, in which pyrites containing traces of selenium have been treated. The great chemical industry contains, however, still another product which is very rich in selenium, and I am sure it will be immediately recognized by chemists who are occupied in the manufacture of chemical products. I refer to the deposit which is formed in the condensation bottles of hydrochloric acid. It results from the volatilization of selenium contained in the sulphuric acid used for the decomposition of salt. Among the larger factories of chemical products, the acid generally used for this purpose is derived from the Glover's tower, and a sufficiently strong proportion of iron renders it undesirable for the manufacture of concentrated acid. In the Glover's tower the selenic acid coming from the roasting of the pyrites is reduced by the sulphurous acid into selenium, which is in part dissolved in the acid and partially remains suspended in the mass. The proportion of selenium retained in this way in the acid is often sufficient in quantity to communicate to the acid a very pronounced blood-red coloration; such would be the case with an acid made from the pyrites of Sain Bel, near Lyons, France. The estimation of selenium in such acid may be easily made when a sufficient quantity is used for the determination; three times its volume of water is added, and then it is allowed to slowly evaporate in a warm place. The clear liquid is decanted by means of a syphon; the selenium precipitated is collected on a tarred filter, and washed and dried in an oven at 100° C.

From analyses made on the Glover acid and on the chamber acid, the following results were obtained:

Glover Acid.
Density..... 1.006 (54°5 Beaumé)
Selenium in 1 liter..... 0.0253 Grams.
Selenium to the 1000 grams..... 0.0176 "

Chamber Acid.
Density..... 1.532 (50°2 Beaumé)
Selenium in 1 liter..... 0.0642 Grams.
Selenium to the 1000 grams..... 0.0223 "

These estimations show that the selenium is found in quite appreciable quantities in the commercial acids. The selenium, becoming volatile at a dark-red heat, is carried over with the hydrochloric acid vapors during the calcination of the sulphate in the mufflers, and is deposited in the first condensing flasks of the acid. It sometimes happens that the hydrochloric acid is so strongly

charged with selenium that it shows a very beautiful red fluorescence, and that the glass tubes used for connecting the condensing flasks and for the removal of the acid become covered with a layer sometimes several millimeters in thickness. The estimation of selenium in such an acid gave me the following results:

Density..... 1.165 (39°4 Beaumé)
Selenium in 1 liter..... 0.025 Grams.
Selenium to the 1000 grams..... 0.0214 "

The very abundant deposit which is formed in the condensation bottles is found to resemble brick-red clay, becoming black as it is desiccated. Selenium is found mixed with all sorts of refuse, especially the tarry material which is used to lute the connections of the Woulfe bottles. From a number of analyses made of the refuse dried at 100° C., the proportion of selenium was found to vary from 41 to 45 per cent. The estimation was performed in the following manner:

and replaced by the second one of the series, which thus becomes the first; the last bottles must always receive the freshest dust. The liquid, which is colored black, is filtered through felt, and then brought to boiling in the presence of an excess of hydrochloric acid, which reduces the selenious acid to selenic acid with the evolution of chlorine. Returning to the treatment of the substance itself, the selenium is thrown down in large earthenware vessels by the acid sulphite of sodium, which is added until a strong odor of sulphurous acid is given off. The metalloïd, which is of a magnificent crimson-red color, is precipitated in large flakes, and collects together into a mass reflecting a bronze tint. It is then brought to boiling by means of steam; the precipitate rapidly collects at the bottom of the vessel, and contracts in the form of a steel-gray mass having a spongy appearance. The selenium thus obtained is washed,

in the *Badische Gewerbe Zeitung*, is Mushet's "special steel," the valuable qualities of which are spoken of. It contains up to 87 per cent. Wolfram and 2.6 per cent. manganese. It is extremely hard and tough—resisting a good English file—but it is softer if the ordinary hardening process be employed. Opinions are divided as to the merits of Wolfram steel, although some important practical authorities recognize its valuable properties. The partial degree in which this metal has been adopted is attributed to the fact that the ore is but seldom met with. It is also stated that articles have been sold under the name of Wolfram steel which contained no trace of Wolfram, and thus misapprehensions on the subject may have been created among consumers. Two well-known chemists thought they had proved that Wolfram cannot be alloyed with any other metal except iron. This assertion seems, however, to have been proved fallacious. Biermann,

softest made, in the form of wires, bars, sheets, plates, angles, tees, channels, &c., tested under tensile stress. Cards accompanying each specimen give the elastic and ultimate stress in pounds per square inch; the contraction of area at the fracture; the extension at 40,000, 50,000, 60,000, 80,000 or 100,000 pounds per square inch, and the ultimate elongation. The collection, moreover, contains specimens of the above materials tested under compression, bending, twisting and shearing stresses, and also samples of copper, copper alloys, steel and iron castings, granite, marble, cement, wood, chains, hemp, manila and wire ropes, and riveted and welded joints, cards with the results of the tests accompanying each. Two somewhat similar collections have been supplied by Mr. Kirkaldy to the Imperial College of Engineering, Japan.

Examination of Stationary Engineers in Philadelphia.

At the October meeting of the Franklin Institute, Mr. John W. Nystrom read a preamble and resolution concerning compulsory examination of stationary engineers in Philadelphia. On motion of Mr. Nystrom to appoint a committee of five to consider and report upon the resolution, which was carried, the president of the Institute appointed Messrs. Washington Jones, Coleman Sellers, Jr., Thomas Hockley, C. M. Cresson, and John W. Nystrom, chairman.

At the November meeting of the Institute a majority of the committee reported as follows:

The committee to whom was referred the matter of memorializing City Councils on the subject of compulsory examination of engineers and firemen report:

That in their opinion City Councils have not power under existing acts of Assembly to pass the ordinance proposed.

WASHINGTON JONES,
COLEMAN SELLERS,
THOMAS HOCKLEY.

The chairman of the committee declined to sign this report, on the ground that a committee of the Franklin Institute should not give an opinion on law, which should be decided by the City Solicitor. The City Councils, however, have the power to pass the proposed ordinance under existing acts of Assembly.

Mr. M. Eldridge moved the adoption of the majority report, which was lost by a small majority.

Mr. Nystrom then moved to increase the committee from five to seven, which was carried, and the president accordingly appointed Messrs. W. A. Ingham and Wm. Helm on the committee.

At the meetings of the committee, two of its members were strongly opposed and raised many objections to compulsory examination of engineers, and in order to remove these objections the chairman of the committee considered it necessary to amend the proposed ordinance, as follows:

To the President and Members of the Franklin Institute.—Gentlemen:

PREAMBLE.

Whereas, The city of Philadelphia has suffered a great many disastrous steam-boiler explosions which could have been prevented by proper precautions; and,

Whereas, There are now in use in the city of Philadelphia some 600 boilers which have dangerous flat cast-iron heads and other defects; and,

Whereas, Any one of these boilers is liable to explode at any moment if in charge of an incompetent hand; and,

Whereas, Such a great number of dangerous steam boilers cannot reasonably be removed without great inconvenience and expense to the owners of these boilers; and,

Whereas, It is known that the explosions of this class, as well as of other classes, of boilers have been caused by incompetent attendants; and,

Whereas, It is of equal importance to examine stationary engineers as it is to examine steamboat engineers, for the reason that human life is as precious on land as on water; and,

Whereas, It has been demonstrated by explosions that the object of steam-boiler inspection cannot be rendered effective without competent attendants; and,

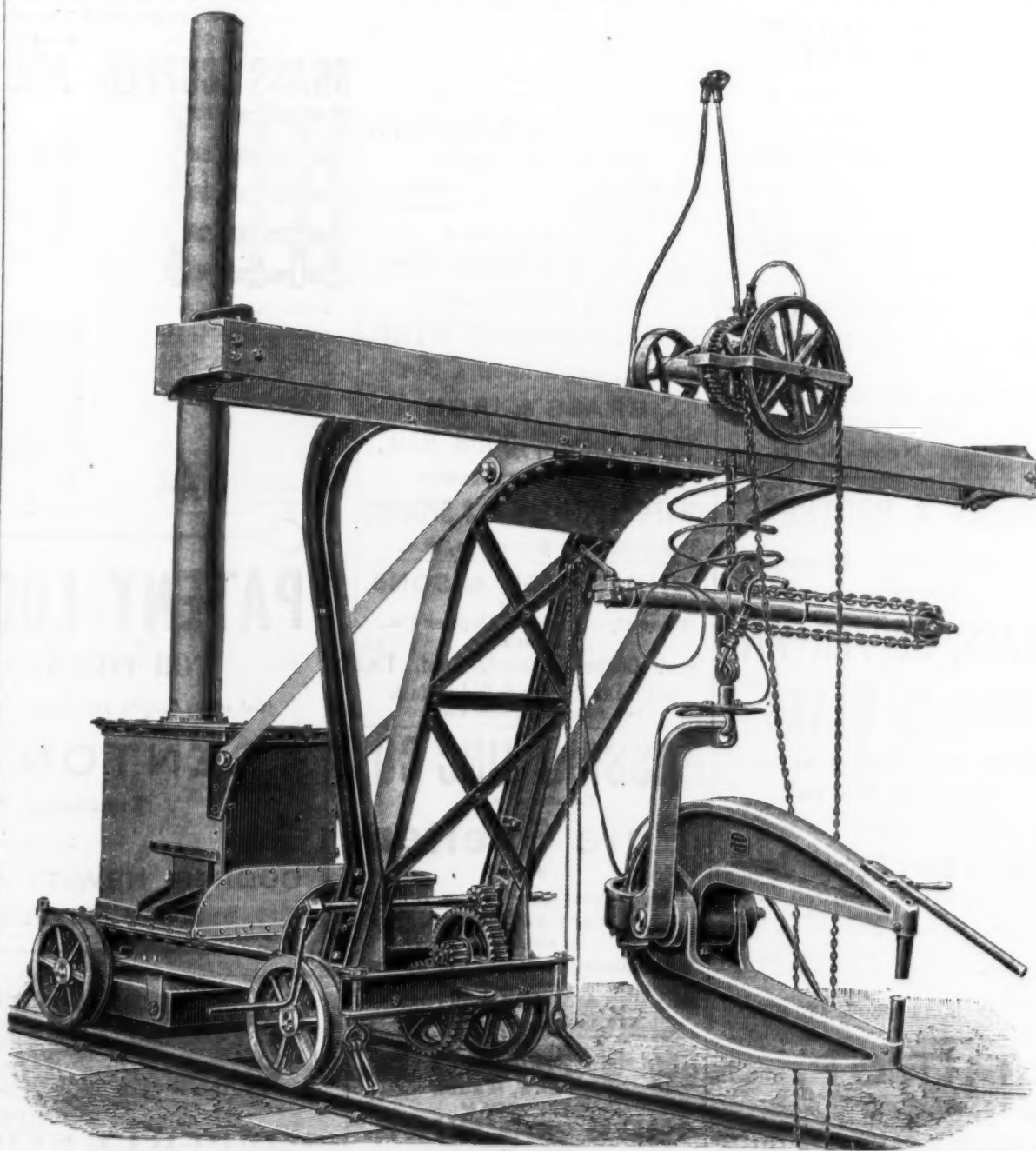
Whereas, It has been proven by experience that it is necessary to examine steamboat engineers in order to render steam-boiler inspection effective; and,

Whereas, It would be of great advantage to the city of Philadelphia, as well as to the steam users therein, in regard to safety and economy in the working of steam engines and boilers, to elevate stationary engineers by examination and grade to the level of steamboat engineers; be it

Resolved, That the mayor and councils of the city of Philadelphia be respectfully requested by the Franklin Institute to pass an ordinance to the following effect, viz.: Supplement to an Ordinance of July 13, 1868, Entitled an Ordinance Regulating the Inspection of Steam Boilers in and for the City of Philadelphia, Pennsylvania.

Sec. 1. The Select and Common Councils of the city of Philadelphia do ordain, That from and after the 1st day of January, 1884, all engineers and firemen who have charge of stationary steam engines and steam boilers operated in the city of Philadelphia, shall apply to the city chief boiler inspector

(Continued on page 5.)



TWEDDELL'S PORTABLE HYDRAULIC RIVETING MACHINE.

Twenty grams of the dried dust were introduced into a matrass having a long neck, diluted with water to which caustic soda had been added until a feeble alkaline reaction was apparent. This mixture was then treated in the cold with bromine, which was added drop by drop, and continually agitated until the temperature was no longer increased. After a while it was filtered; the filtrate, together with the wash water, was brought to boiling with the addition of a small quantity of hydrochloric acid; the selenium was thrown down by the sulphurous acid, collected on a tarred filter and weighed.

For the industrial extraction of selenium from this deposit I made use of the following process: The dust, mixed with water, was treated in the cold with chlorine in a series of large Woulfe bottles. The chlorine was taken directly from one of the leaders of chlorine in the factory, and drawn through by a strong aspiration. The selenium was converted into the ultra-chloride, which in the presence of water became selenious acid; this, when the chlorine is in excess, becomes partially transformed into selenic acid. Finally there is obtained a strong acid solution containing selenious, selenic acid and hydrochloric acid.

$\text{SeCl}_4 + 3\text{H}_2\text{O} + \text{Ag} = \text{SeO}_3\text{H}_2 + 4\text{ClH Ag}$
 $\text{SeO}_3\text{H}_2 + 2\text{Cl} + \text{H}_2\text{O} + \text{Ag} = \text{SeO}_4\text{H}_2 + 2\text{ClH Ag}$

When the brick-red color disappears completely from the first bottle, it is withdrawn

dried and then melted in a clay retort exposed to the naked fire, and cast by either pouring in water or into glass molds.

Wolfram and its Alloys.

The most important combinations of Wolfram which occur in nature are tungstate of lime or scheelite, as well as Wolframite, which is also designated Wolfram. The last mineral, observes an English exchange, seems principally to produce Wolframic acid from which the metal is obtained. Wolfram has the color of iron, is brittle and so hard that it scratches glass. It has not yet been found possible to melt it. The specific gravity of metal is not soluble in mineral acids, nor even in aqua regia in a cold state, nor in caustic potash lye. It is only soluble in chloride alkalies. At an ordinary temperature the metal is not changed by exposure to the air. One of the combinations of the acid (tungstate of soda) has lately been recommended as a protection for tissues against flame. Although discovered at the end of last century, it was a long time before Wolfram had any technical employment. During the last 30 years it has been used as an alloy for iron and steel. By the melting together of Wolfram and scale a Wolfram iron is produced, which contains 53 per cent. of Wolfram, and serves for the manufacture of Wolfram steel. In the latter the proportion of Wolfram varies (if the alloy only consists of steel and Wolfram) between .6 per cent. and 4.7 per cent. A Wolfram steel, with the addition of manganese (referred to

of Hanover, has for several years produced Wolfram alloys with several metals. Reference is made to a bronze known as Biermann's Wolfram bronze, costing about 2/9 per pound. It contains 95.4 per cent. of copper, 3 per cent. of tin and 1.6 per cent. of Wolfram, is tough, malleable, capable of being rolled and of great strength. For its working a temperature is required about 180° F. above that required for ordinary bronze. If Wolfram is heated with copper and coal dust in hermetically-closed crucibles, a tough alloy is obtained with 12 per cent. of Wolfram, which is well adapted for axle journals and telegraph wire. In the *Journal Mensuel des Travaux de l'Académie Nationale*, Dr. Alexander Neujean, of Liège, has recently dealt with the question of alloys of Wolfram with copper, zinc, lead and tin, defining their proportionate composition and the manner of preparing them. According to the journal in question, these alloys possess great toughness, extensibility and hardness, and are sometimes used as imitations of gold and silver.

We understand that Mr. David Kirkaldy is about to send to the Technological and Industrial Museum of New South Wales, at Sydney, a number of cases of specimens illustrative of the mechanical properties of various kinds and qualities of structural materials. The collection consists of over 300 specimens, representing various qualities of steel and iron, from the hardest to the

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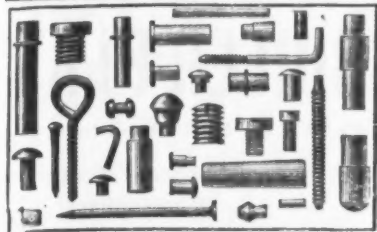
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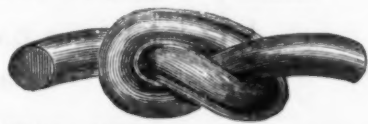
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(Continued from page 1.)

for certificate of competency as hereinafter provided.

Sec. 2. The city chief boiler inspector is hereby authorized and required to designate the time and place when and where all applicants for certificates shall be entitled to apply for examination, and shall receive certificates if found to be competent and of good standing. For this purpose the said city inspector shall sit at least once a month.

Sec. 3. That the said city inspector shall have an assistant examiner, whose duty shall also be to keep records of qualification and standing of each stationary engineer and fireman who holds a certificate of competency, and that each candidate shall be examined by both the said city inspector and his assistant examiner, and both sign the certificate if found to be competent.

Sec. 4. That the said city inspector shall issue certificates of five different classes, namely, as follows:

First class certificate shall be issued to any stationary engineer who has been continually in charge of the working of engines and boilers for a term of not less than ten years, and can pass a thorough examination in the practical management and care of stationary steam engines and steam boilers; in the rudiments of the sciences involved in his profession, such as elements of mechanics; properties of water and steam in relation to heat; properties of different kinds of coal in relation to combustion and its economy; in the construction and properties of different kinds of stationary engines and boilers; in the properties and uses of steam indicators and indicator diagrams, and in the principal causes and prevention of steam-boiler explosions. Any candidate who is found by examination to be worthy of a first-class certificate, shall be distinguished thereon as chief engineer.

Second-class certificate shall be issued to any stationary engineer who has been continually in charge of the working of stationary steam engines and steam boilers for a term of not less than five years, and can pass a thorough examination in the practical management and care of stationary steam engines and steam boilers, including the taking of and working out indicator diagrams, and in the principal causes of steam-boiler explosions.

Third-class certificate shall be issued to any stationary engineer who has been continually in charge of the working and care of stationary steam engines and steam boilers for a term of not less than two years, and can pass a thorough examination in the practical management and care of such engines and boilers, and in the principal causes of steam boiler explosions.

Fourth-class certificate shall be issued to any applicant whom the examiners find competent to take charge of stationary engines and boilers of horse-power not exceeding that which shall be stated on the certificate.

Fifth-class certificate shall be issued to any fireman whom the examiners find competent to take charge of steam boilers used for heating purposes in manufacturing establishments where no steam engine is used.

Sec. 5. For these certificates each party receiving the same shall pay a fee, as follows: First-class certificate, \$5; second-class certificate, \$4; third-class certificate, \$3; fourth-class certificate, \$2; fifth-class certificate, \$1.

Sec. 6. All moneys collected as fees by said city inspector for aforesaid certificates shall be paid over to the city treasurer, and the city comptroller shall audit the accounts annually.

Sec. 7. That during the first six months of year 1884, the time in which this ordinance shall be brought into full effect, those stationary engineers and firemen who are well known to the said city inspector, or to his assistant inspectors or examiners, to be competent and of good standing, may receive a third, fourth or fifth class certificate without examination, but after the expiration of said six months—that is, on or after the first day of July, 1884—every applicant must be thoroughly examined as aforesaid before receiving a certificate of competency.

Sec. 8. That on and after the first day of July, 1884, all stationary steam engines and steam boilers operated in the city of Philadelphia shall be run and in charge of only such stationary engineers as shall be furnished with proper certificate of competency as before provided.

Sec. 9. That when any engineer or fireman who has received a certificate is afterward found to be incompetent or negligent in his duty, the said city inspector may cancel and revoke such certificate, and he may, by re-examination, issue to such engineer or fireman another certificate, but of a lower class to an engineer.

Sec. 10. That the said city inspector shall refuse to grant certificate of inspection to any party who shall maintain or keep in use or in operation any stationary steam engine or steam boiler within said city of Philadelphia, which shall not be in charge of an engineer duly furnished with a certificate of competency as aforesaid.

Sec. 11. That whenever the said city inspector shall learn of any stationary steam engine or steam boiler being operated within said city of Philadelphia, otherwise than by an engineer duly qualified and furnished with a certificate as aforesaid, he shall forthwith cancel and revoke his certificate of inspection.

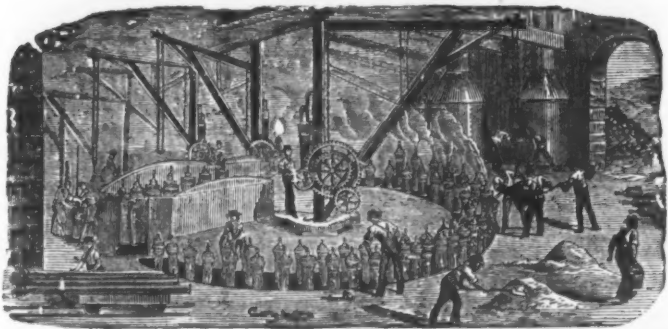
Sec. 12. That the certificate of inspection held by any steam user who shall attempt to operate a steam engine or steam boiler without the care of an engineer furnished with a proper certificate of competency shall be deemed and adjudged forfeited, and such steam user shall be subject to all the pains and penalties provided by the act of Assembly of May 7, 1864.

Sec. 13. That nothing in this ordinance shall be so construed as to render the city of Philadelphia responsible for any damage caused by steam-boiler explosion or other accident occurring from neglect or incompetency of any engineer or fireman who may have passed his examination and received a certificate of competency from the proper authorities.

Sec. 14. All ordinances or parts of ordinances inconsistent herewith are hereby repealed.

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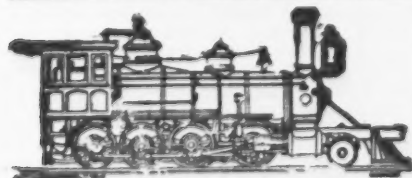
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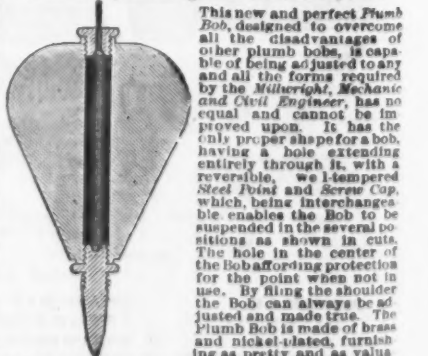
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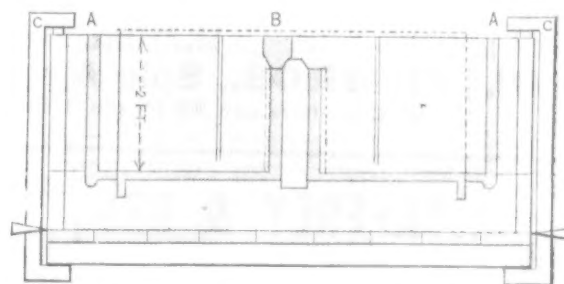
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BY T. H. RADCLIFF.

In this article it is proposed to give four examples as they occur in practice of the pressure of iron, when in a liquid state, on the surfaces of a mold. It is not always understood that it is the vertical height and surface that make the pressure, and not

height of the gates being 24 inches. The pressure to lift the covering plate is equal to the weight of a piece of iron as shown by the dotted lines. The area of a circle being equal to the product of the square of the diameter and .7854, we have for the lifting pressure in this case, $88^2 \times .7854 \times 24 \times .26$ pounds = 37,952 pounds. In addition to the cross and bolts as generally used on a piece like this, there were eight strong clamps



Foundry Hydraulics.—Fig. 1.—Square Casting, with Hub.

the diameter of the column. To illustrate this, fill two barrels with water. Into the head of one screw a 1-inch gas-pipe 4 feet long, and into the head of the other a pipe 6 inches in diameter and 4 feet long. Now bore a 3-inch hole in the head of each barrel and attach a temporary valve; also place an equal weight on each valve—say, 5 pounds. It will be found that the water will have to be raised just as high in the 6-inch pipe

running from the top and bottom plates put on before ramming up inside the curb. It will be noticed that the average height has been taken in this case—that is, 3 inches has been added to the height at the joint for the weight of the crown, which is a segment of a sphere. The result is nearly the same, being a little on the side of safety. The following rule for finding the contents of a segment of a sphere is given for those who

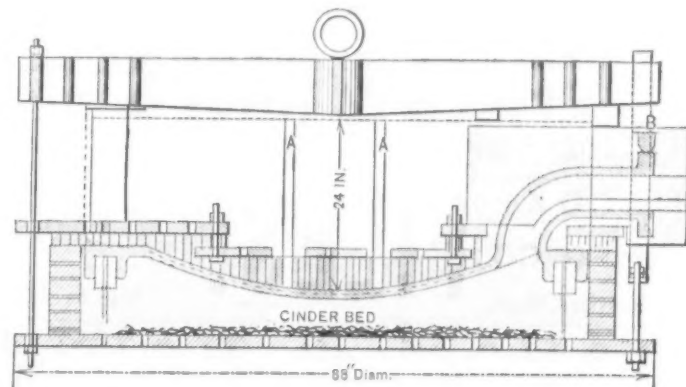


Fig. 2.—Still Bottom.

to lift the valve as it does in the 1-inch pipe, thus showing that it is the height and surface that make the pressure, and not the diameter of the column. What applies in this case applies also to iron when in a liquid state. It is the height of the gates above the surface that makes the lift.

The first example given is that of a casting 5 feet square and 1 inch thick, with a hub 8 inches in diameter and 18 inches deep cast in the cope, the sinking-head or riser being

prefer to use it: From three times the diameter of the sphere subtract twice the height of the segment; multiply this remainder by the square of the height, and the product by .5236. The diameter of which this segment is a part being 152 inches, we have $152 \times 3 - 16 \times 64 \times .5236 \times .26$ = 3833 pounds, which is the weight of a segment of a sphere 152 inches in diameter and 8 inches high. If this rule be used, 3 inches will have to be subtracted from the average



Fig. 3.—Gas-Works Purifying Box.

6 inches higher, making a head of 24 inches from the top of the gates to the joint of the flask, as is shown in Fig. 1. The pressure to lift the cope is equal to the weight of a piece of iron shown by the dotted lines, and is found by multiplying the area by the perpendicular height, and this product by the number of pounds in a cubic foot of iron. We then have for this example $5' \times 5' \times 2' \times 450$ pounds = 22,500 pounds. There is then a pressure of 11 tons 500 pounds to lift the cope on a casting 5 feet square with a

height as given above, and, of course, 3833 pounds added to the result.

The next example is a gas-works purifying box, the casting being 5 feet square, $\frac{3}{4}$ inch thick and 26 inches deep, with 8 inches added for gates. In order to find the pressure on the sides of the flask, we multiply the side surface by one-half the perpendicular height, and this by the weight of a cubic foot or inch of iron, according as feet or inches have been used in the previous part of the example. Then $60' \times 26' \times 17' \times .26$ pounds =

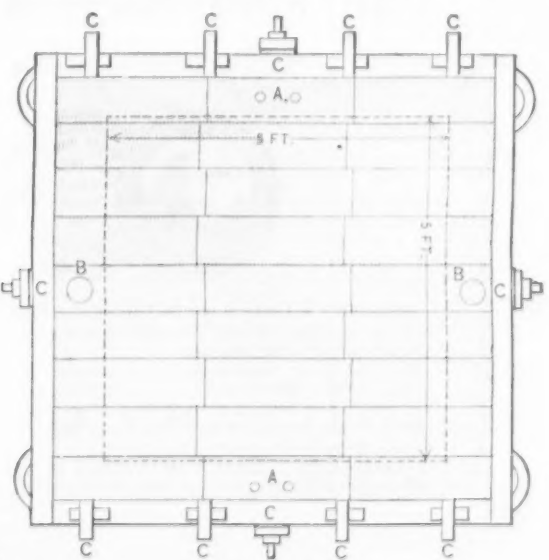


Fig. 4.—Top View of Mold in Fig. 3.

head of 24 inches, and the clamps or bolts used will have to be strong enough to sustain a weight of this size. The foot of the clamps should come under the battens of the bottom-board, and be drawn up reasonably tight by getting a purchase under the top foot of the clamp with a pinch bar, tapping the wedge up with a hammer. There should also be a wedge driven between the bottom-board and drag alongside of the clamp, so as to have a solid bearing from top to bottom.

The next example is a still bottom with an outlet cast on, as shown in Fig. 2, the casting being 88 inches in diameter and the average

6895 pounds pressure on one side, which, multiplied by 4, the number of sides, = 27,580 pounds pressure on the sides of the flask for a casting as given above. A piece of this kind requires strong side clamps, secured by 1-inch bolts above and below. In the above example 17 inches is one-half the height, measuring from the top of the gates, and .26 pound is the weight of a cubic inch of iron. It must be remembered that the pressure increases from the top of the gates to the bottom of the casting, where it is the full head of 34 inches, and diminishes from the bottom to the top, where it is nothing. The lift on

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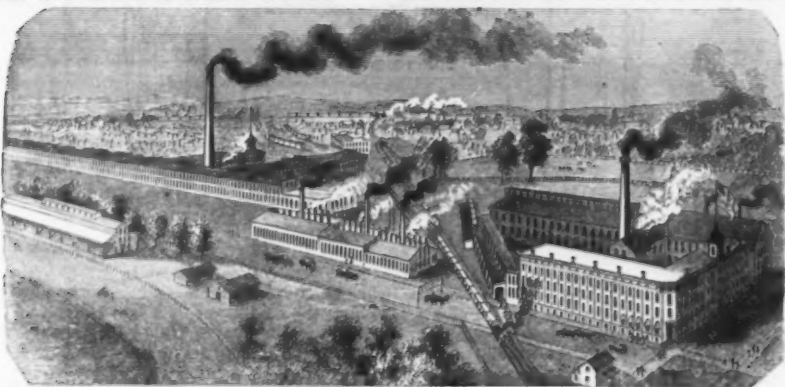
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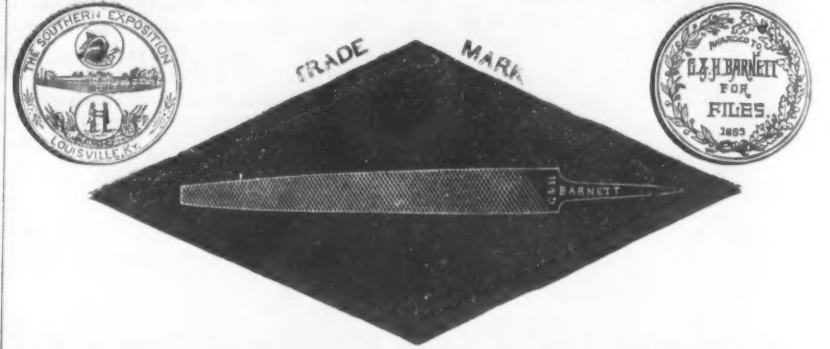
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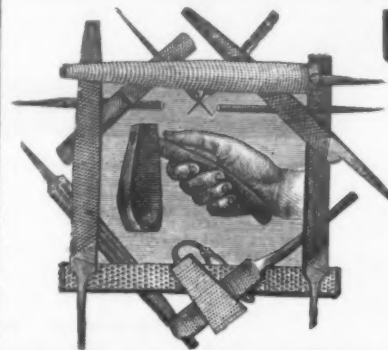
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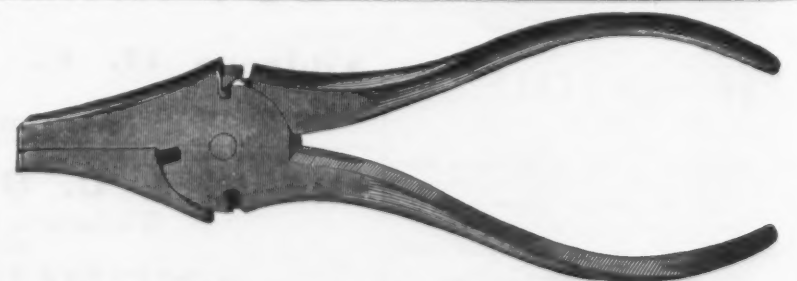
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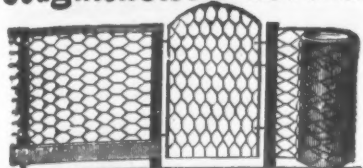
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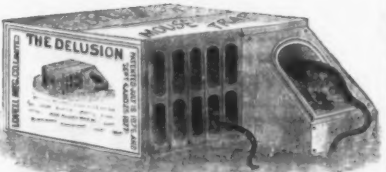
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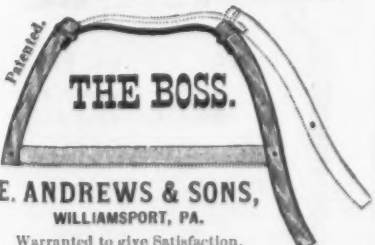
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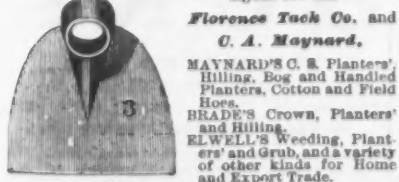
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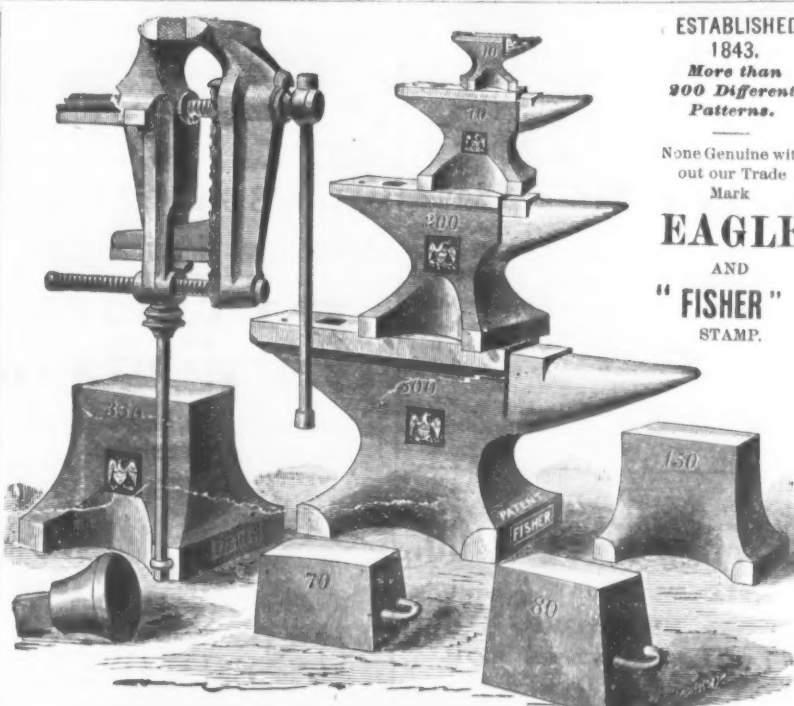
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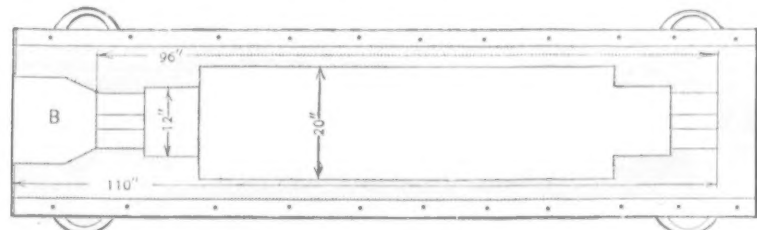
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the cope is equal to the weight of a piece of iron shown by dotted lines in Fig. 3, for which the same rule is used as in Fig. 1. The next example is a roll, the casting measuring 96 inches from end to end, 20 inches in diameter in the body and 12 inches in diameter at necks. As shown at Fig. 4, necks and wabblers being 18 inches long, we have first $20 \times 3.1416 \times 60 = 3769'$ of curved surface, which is to be considered as a plane for the body of the roll, and $12 \times 3.1416 \times 18 \times 2 = 1357'$ curved surface for the necks. Then $3769 + 1257 = 5126'$, which, multiplied by 55, one-half the height, = $281,930 \times .26$ pounds = 73,301 pounds. There is consequently a pressure of 36 tons 1301 pounds on the sides, and the bolts and flanges of the flask must be strong enough to

table top is entirely free from obstruction, and has a capacity for blocks 36 inches wide and of indefinite length. An iron bed-plate is used, in which is arranged a very convenient device for gripping or holding the work. The gripping-dog has a forward and downward movement, which in securing the work tends to press it firmly to the surface of the bed-plate. No special attachment or change is required for equally and firmly securing the thinnest plate or the most irregularly shaped block. The machine has been carefully designed, and thorough construction characterizes all its parts. Another form of routing machine is also manufactured by Messrs. Royle & Sons, which, in contradistinction to the one we have already described, is known as the radial-arm ma-



Foundry Hydraulics.—Fig. 5.—Roll Flask.

sustain this weight, with a good margin for safety. It is understood in the above examples that the velocity, and consequently the momentum, of a moving body of iron have been reduced to a minimum. It should be stated that it is not my intention to go into the details of the flask or loam mold, but to give just enough of them to illustrate the subject. (In the engravings A represents the pouring gates, B the risers or sinking heads, and C the clamps.)

Routing Machine.

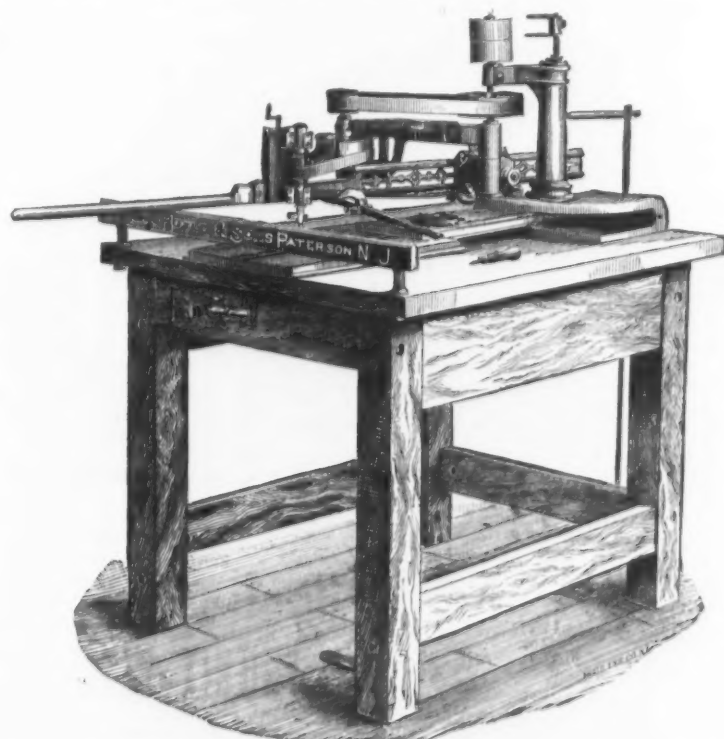
In the figure we show a straight-line routing machine, manufactured by John Royle & Sons, of 62 Railroad avenue, Paterson, N. J. This machine was exhibited at the fair of the American Institute, last fall, and it not only attracted marked attention upon the part of mechanical visitors generally, but was also awarded the medal of superiority. The purpose of the machine is to deepen with facility the depressed or white portions of woodcuts, electrolytes, stereotypes and the like. It is also used for making coarse wood engravings and for the manufacture of blocks for printing fine paper hangings. The same principle is capable of extension in the form of machines to be used in stair building and other departments of carpentry and joinery. The deepening to which we have referred, and which is technically known as "routing," is done by means of a rapidly-revolving vertical cutter, which can be adjusted to the proper depth below the surface of the work, and which is capable of movement in all directions required in a horizontal plane. This machine has, in addition to the general requirements for such work, the special advantage of cutting straight and parallel lines.

chine. It is somewhat simpler in its parts than the straight-line machine, but it is also very effective for use.

New Inventions.

A bit for drilling square holes has been patented by E. H. Bieber, of New York City. The bit consists of a triangular rod, one end of which may be clamped to a chuck or brace. At the other end it has three radial cutting edges. Upon the plate to be drilled is placed a guide block having a square hole cut out equal to the hole to be drilled into the plate. The bit is then passed through this hole, and the cutting edges act on the plate. Each edge of the bit is made to revolve in a corner of the guide hole, while the other two edges slide along its sides. The bit will thereby receive an irregular eccentric motion, and is guided in such a manner as to drill an approximately square hole. The claim of the patentee covers the combination of a three-angular bit with a guide plate having a square hole.

An invention designed to protect the jamb plates or plates on either side of the mouth of steam boilers, heating furnaces, &c., has been patented by T. O'Brien, of Boston, Mass. These plates, being on the interior of the furnace, are rapidly destroyed or warped and rendered unfit for use after a short time by the intense heat of the furnace. The inventor incloses each jamb plate by a guard or jacket of such size that an air-space or flue is left between jamb and guard. The guard is provided with a series of perforations opening from said air-space into the front corner of the furnace. Thus,



Straight-Line Routing Machine, Built by John Royle & Sons, Paterson, N. J.

Accordingly, it is found useful in various processes of finishing and decorating work, as lines can be cut with facility and accuracy by it which otherwise could only be performed in a much more expensive manner. The construction of the machine and the means by which its several motions are obtained are very clearly shown in the engraving. A very high rate of speed is obtained upon a spindle which is made of hardened cast steel with carefully ground bearings. It may be safely run as high as 15,000 revolutions per minute. The rate at which it is operated depends, of course, upon the character of the work being done. The machine has the advantage of being very steady when in motion. The cutter-bearing arm is supported upon friction rollers, and is controlled by both hands. A light handle is properly arranged for each hand, the routing one of which is made extensible. The arrangement of this handle with a gutter above is such that it may be changed to the most convenient point at the will of the operator, without interfering with his position while routing or with the progress of the work. This enables the operator to rout very closely to the lines and into the most delicate spaces with ease, confidence, precision and rapidity. By changing the gutters metal or wood is routed equally well. The machine is designed for routing zinc, stereotype plates, either blocked or unblocked, letter blocks, wood engravings and show-bill cuts. The

the guard affords protection to the jams and serves also to conduct a current of air to the interior of the furnace in such a manner as to produce perfect combustion of the fuel, which accumulates in the forward corners of the same.

W. S. Dawson, of Cisco, Ill., is the inventor of a tool designed to tightly hold a bolt while a nut is being screwed on to it. It is composed of two jaws, both serrated. The upper jaw, which is to press on the head of the bolt, is made in one piece with the handle. The lower jaw is bent to reach under the plate, through which the bolt is passed, and is pivoted to the upper jaw. When the tool is in place the handle is raised, and thereby such a pressure is brought to bear upon the bolt and plate that the bolt cannot turn. The pivotal connection between the two jaws is adjustable, so that the instrument can be adapted to different widths of timber.

A compound metal-working machine claimed to have great force, and intended to give eccentric power to punches, shears, presses and the like, is composed of two segmental toothed jaws, both eccentric and meshing into one another. Each jaw is provided with a stem, one serving as the power lever or handle, while the other is recessed at its forward end to receive a punch or other suitable tool. The power handle is by

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NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson, to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,
FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESSES:
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(Attorney for Defendant.)

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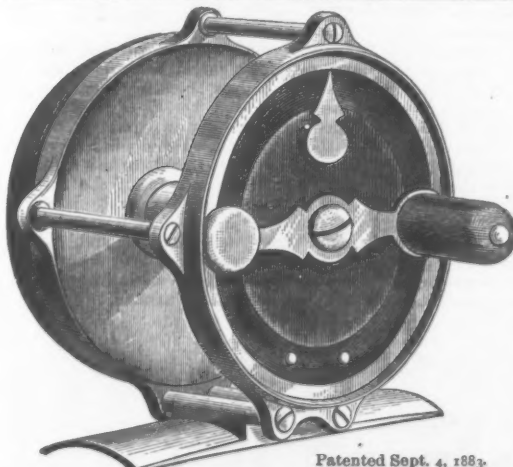
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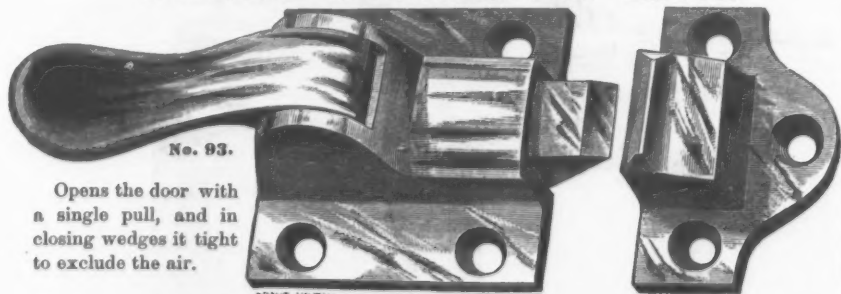
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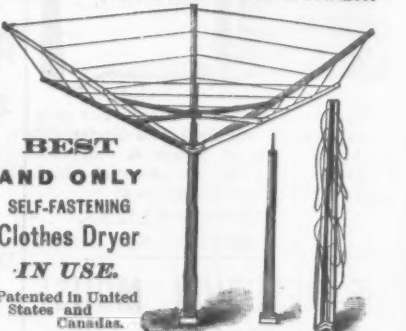
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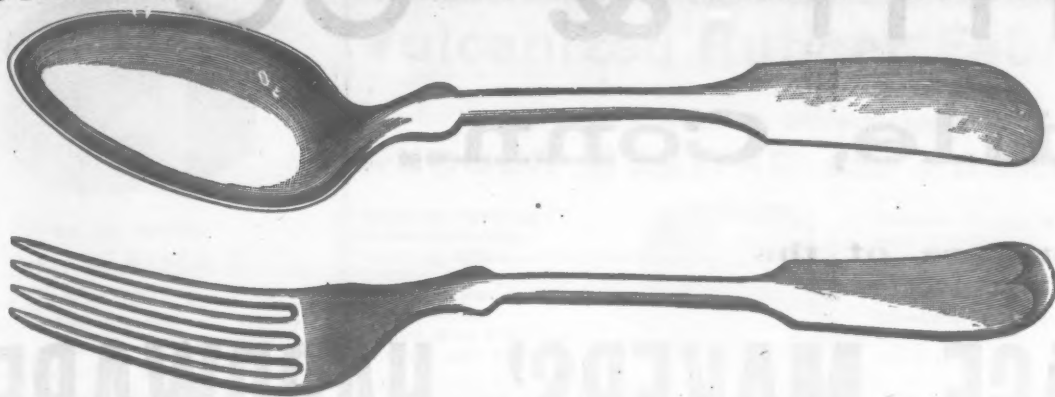
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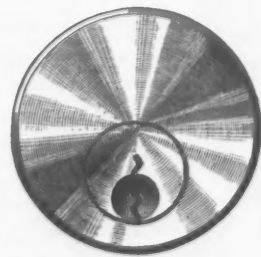
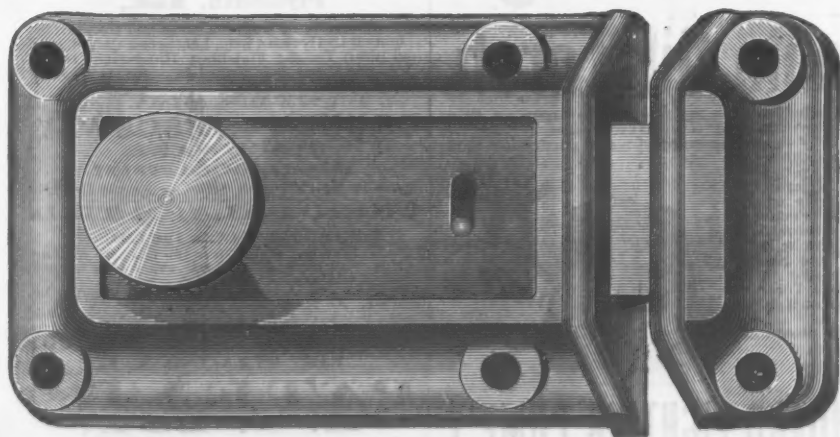
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a double lever connected to the second jaw, so that when said lever is worked both jaws turn eccentrically on their pivots and give motion to the tool-holder. Thus the levers add their force to that of the eccentric in the forward movement, and in the reverse movement they pull back to the holder and tool. This machine has been patented by N. J. Rice, of Vernon, Pa.

A patent steel-tired elastic wrought-iron railway wheel has been used largely in Canada, and it is claimed that these wheels, although high in first cost, possess superior merits to the cast-iron chilled railway wheels in general use. These latter are cheaper, but are inferior in wearing power. Mr. Herbert Wallis, mechanical superintendent of the Grand Trunk Line, reports that the average mileage of 828 wheels from the first turning has been 73,566 miles, and these are still running. The highest mileage obtained from the first turning has been 228,643 miles, and the highest total for any wheels now in the service is 474,311 miles.

G. H. Webb, of Pawtucket, R. I., has constructed a new blast furnace for heating bolt blanks. In these furnaces one side of the fire-box is left open, and the blanks are piled up against such open side, so that their heads are brought into direct contact with the mass of burning coal. This causes the blast in the furnaces, as usually constructed, to drive out the heat and flames, and thus the workman is prevented from conveniently removing the heated blanks. The inventor proposes to intercept and divert the hot-air currents by a strong vertical blast of cold air. The cold blast passes from an air chamber upward and into a wind-box projecting in front of the fire-box toward the workman. The wind-box is placed on about a level with the grate, and has upwardly opening slots. Through these the cold blast escapes with force sufficient to cut off the horizontal hot-air current issuing between the pile of blanks from the fire-box. Thus a body of cold air is formed in front of the furnace, shielding the workman from the intense heat, while permitting close handling of the heated blanks.

A new rumble for scouring castings, washing ore, &c., consists of a cylinder journaled on the upper edge of a tank partly filled with water. The cylinder has buckets or chambers formed around it, arranged to scoop up the water into which they dip, raising a portion of the same and conducting it toward the axis, where it is discharged into the cylinder. The castings, sweepings or ashes containing metal dust or scraps are placed into the cylinder through a door or feed-spout, and the tank is filled with water. Motion being imparted to the cylinder, it revolves with its lower portion containing the castings immersed in the water. During the rotation the buckets raise the water at one end, and thus cause a circulation or current which will draw off the lighter waste matter. Thus the sand, scale and other dirt is readily removed from the castings, the water carrying off the waste through ports or outlet openings. The castings, when sufficiently scoured, are removed by means of the same door through which they were introduced. The apparatus has been patented by E. W. Vanduzen, of Newport, Ky.

A simple device for sawing removable saw teeth when worn has been patented by S. J. Chalfant, of Albion, Col. These teeth, which are now generally thrown away when dull, may be made almost as good as new several times before they become worthless. The teeth are held in a die block, which has a curved face conforming to the shape of the back of the saw tooth. A clamping lever die may be pressed down upon the upper side of the teeth by a cam lever pivoted in a slot of the die block. The dies are so applied that they may be taken out and others adapted to teeth of different form put in. The entire machine is held in the jaws of a vise, so that it will sustain the blows of a hammer.

C. Reusch, of New York City, is the patentee of a new process of making enameled sheet metal ware. As usually made the body of the vessel is first coated on the interior with enamel, after which the exterior is coated by an electro-deposition of copper or other suitable material. As this coating is very thin it is liable to wear off and expose the iron body. The inventor unites by rolling a sheet of iron with a sheet of copper; then stamps the united sheets into the required hollow form, and finally lines the interior surface with glaze or enamel. In this way the vessel has a thick and substantial copper coating, which considerably increases its value and durability.

A tool for miners' use which combines a candle-holder, fuse cutter and suspending hook is composed of a bar pointed at one end, to be stuck into a wall, and having a finger ring on the opposite end. Upon the bar is fastened the candle socket. A suspending hook is likewise pivoted to the bar, which is to be used in case the device is to be suspended from a projection. The hook has a small cutting edge which works against a similar cutting edge of the bar. When the fuse is to be cut it is placed on the bar, and the hook swings down. This convenient little tool has been patented by J. Ryan, of Salt Lake City, Utah.

A reversible sad-iron for ironing flutings and trimmings has been patented by J. A. Yarger, of New Hampton, Iowa. This iron has on each side a flat and a convex polishing surface, and it therefore becomes necessary to adjust the handle anew for each polishing surface when used. This is accomplished by means of a squared journal entering a corresponding central socket of the iron and connected by an arm and spring-catch to the handle. When the position of the iron is to be changed so as to use a flat instead of a convex polishing surface, the squared journal is unlocked from the handle, withdrawn from its socket, and reinserted at a different angle, whereupon it is again locked by the spring-catch. Thus the handle may be locked rigidly in any position. The iron is provided with an interior wick tube con-

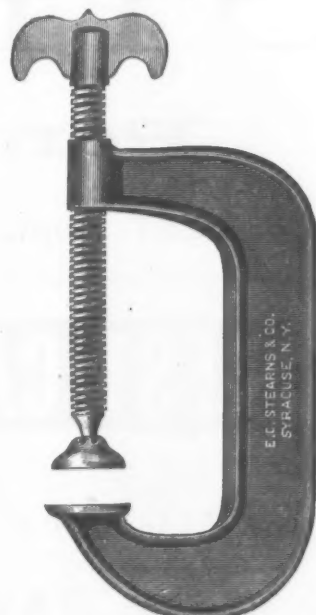
nected to an oil reservoir. This reservoir is also connected to the handle in such a way that when the angle of the handle is changed the reservoir revolves with it, thus being always held in an upright position.

An instrument intended to accurately measure the thickness of sheets of metal, paper, &c., has been invented by E. Morrison and J. P. Herron, of Washington, D. C. This gauge is composed essentially of two jaws, between which the material to be gauged is introduced. One of these jaws is stationary, while the other jaw is movable. The latter is made in the form of a lever, which, when the jaws are opened, swings on its fulcrum. The other end of this lever is curved, and engages a similar curve formed on the end of a pivoted index finger. As the jaw is moved the index finger moves with it along a scale, and indicates on it the thickness of the material between the jaws. Of course, the amount of motion of the jaw is greatly multiplied by the index finger.

An improvement in steam-heating apparatus, patented by J. H. Blessing, of Albany, N. Y., is designed to readily clear of condensed water a heating coil or radiator which is placed below the water level of the boiler, without the necessity of using automatic return steam traps. In the return-pipe of the radiator is placed a receiver above the water level of the boiler. This receiver is connected with the return-pipe of the boiler. A "pass-by" connects supply and return pipes of the radiator, and all the pipes are provided with check-valves. When the radiator is to be emptied of accumulated water the valve in the boiler return-pipe is opened, and, owing to condensation, a vacuum will be formed in the receiver, into which the water from the radiator will flow.

A New Clamp.

Messrs. E. C. Stearns & Co., Syracuse, N. Y., have recently brought out a new iron clamp, the general appearance of which is shown in the engraving herewith. This



New Iron Clamp.

clamp has the special merits of good design, great strength, proper distribution of metal and convenient shape for use to recommend it to favorable attention. It is well made, of good material, and is likely to give satisfaction to all who employ it.

Competitive Tests for Locomotive Men.

A thoroughly good plan for promoting the efficiency of the locomotive department has been adopted by some of our railroads, in the sending out, at frequent intervals, of a test "runner" or "driver," to use the better English word. By giving this driver the train for which the test is to be made for two successive trips, with the engine which belongs to the train, he can tell very closely whether the work done usually by the regular driver is up to the full standard expected. In this way a sort of competitive examination can be made, under very close conditions of working, of the skill of the men upon their usual trains, and with the engines with which they are familiar. To do this in any really useful way, a man is needed for the test driver who is fully in sympathy with the manager or the locomotive superintendent, but who knows at the same time enough of the road and of the actual hard work of driving to do full justice to the men. There are men who need just this sort of sharp watchfulness to bring out at their full value the excellent qualities they possess. There are other men who, when left to themselves, as drivers generally are when out on the road, make no pretense of skillful work, and are hard to be reached by any known means except such as this one referred to. If they are shown once in a while that with the same means which they use themselves an important increase of work can be made, they may sometimes be shamed into a closer kind of work for themselves.

There are some obvious hindrances to the full adoption of such a plan by railroads, but the idea is a good one and worthy of careful consideration on the part of those whose fuel bills are burdensome and out of proportion to those incurred upon roads near by in comparison with the work done.

From statistics concerning the Western Union Telegraph Company, we find that last year the company had 13,917 offices, which sent 40,581,177 messages, at a charge of \$19,454,902.58, and at a cost to the company of \$11,794,553.40, the difference, of course, representing the gross profit. There were 143,452 miles of poles, carrying 428,546 miles of wire, these figures furnishing an apt illustration of the exceedingly rapid growth of the telegraph in this country.

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Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

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BEST CAST U.S. TOOL STEEL

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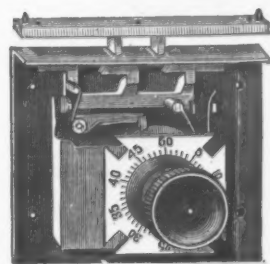
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The Cheapest and Best in the World. Send for Prices.
RETAIL FROM \$1.50 TO \$3.00. 2500 CHANGES.

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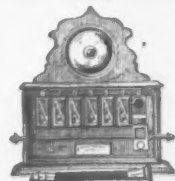


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EASY TO TAKE APART AND CLEAN. BEST OF WORKMAN-
SHIP AND VERY CHEAP. Manufactured and sold by
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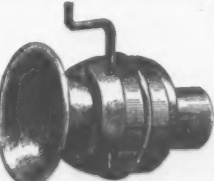


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Complete outfits of Speaking Tubes, Whistles,
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And all descriptions of

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Strap Hinges, 70 and 5 Per Cent., Delivered.

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Bit Braces.

Amidon Brace, 8 to 14 in. sweep.
Barker " " "
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logue, Price List and Dis-
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Nickel
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New Portable Oil Torch.

Given a clear white light, equal to half-a-dozen gas jets, from common Coal
OIL. Burns without a wick; vaporizes the Oil in the coldest weather; costs less
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to clog, and easily cleaned. Owing to the great
force with which this Torch burns, it produces
a better oxygenation of the flame, and will
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stances where it is desirable to have a light
close to work, as in Car and Machine Shops,
Round Houses, Mills, &c. We make these
Torches in several sizes. Our Wall Torch is
the best in the market, and made to burn either
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For full information, prices and discounts,

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122 WATER STREET, CLEVELAND, OHIO.

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For Cutting Round and Flat Bar Iron and Sheet Metal.

MADE ENTIRELY OF CAST STEEL.

Cheapest and best tool for the purpose ever put on the market.

MADE IN TWO SIZES:

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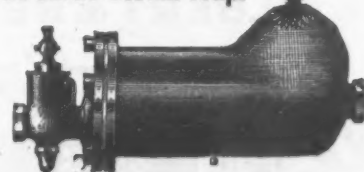
Send for Descriptive Circular.

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The Curtis Steam Trap.



Has automatic air discharge; has a differential open-
ing, thus discharging all the water as fast as it comes.
Is very accessible for cleaning, the valve being on the
outside. Send for circular. Manufactured by the
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Chain Pump Tube
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Patented Feb. 13, 1877; a new combination of Hooks. 436 E. Houston St. New York City.

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These Mills will grind Raw Bones, green or dry; also Ores, Glass, Limestone, Clay—in fact, anything wet or dry.

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Machine Belting, Steam Packing, Leading Hose, Suction Hose, Grain Elevators, Steam Hose, Piston Rod Packing, Gaskets and Rings,

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This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for Armour, Dole & Co. of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R., the great Elevators of the Panama and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others; in fact, the largest Belts for the largest Elevators in the world.

A single carrier belt in the Penna. R. R. Elevator is over 200 feet long, weighing 18,000 pounds, and has run perfectly from the start.

LINEN and COTTON HOSE.

Pat. 654. **Plain and Rubber Lined.** Pat. July, 1873.

"TEST" HOSE. Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.

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Emery Wheels and Packing.
ORIGINAL
Solid Vulcanite EMERY WHEELS

Patented. Patented.

Emery Wheel. LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tool, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural implements, and small Machinery of almost every description.

Pat. Jan. 26, 1866. **PATENT ELASTIC Rubber Back Square Packing.** Pat. Jan. 24, 1869.

BEST IN THE WORLD.

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B represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight and yet creates but little friction.

This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.


Corrugated Rubber Mats and Matting.

Pat. 11,308 113,001. Pat. July, 1879.

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The most complete assortment in the U. S. of
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PLANE IRONS.
CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also "Riverlin Works."

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BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-HEAD GIBS, STEPS, BUSHINGS,
And all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are Desirable.

PUMP RODS, BOLTS & NUTS, MACHINE and WOOD SCREWS, &c., &c.
Combine Toughness, Strength, Durability and Resistance to Corrosion.

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DROP FORGED.
MERRILL BROS., 26 First St., Brooklyn, E. D., N. Y.

Death of John M. Phillips.

John M. Phillips, proprietor of the Hewes & Phillips Iron Works, in Newark, N. J., died of heart disease in his residence at Woodside, a part of Newark, on the 15th inst. He was 67 years old, and was a tall man of athletic build and strictly temperate habits. He arose in apparent good health. His wife quitted the room while he was reading a book. Ten minutes later she returned and found him dead on the floor. He leaves a wife, six sons and three daughters. Four of the sons were associated with him in business.

John M. Phillips was the great-grandson of the Colonel Phillips who commanded the crack corps of Cromwell's army. Colonel Phillips and Dr. Morris, a regimental surgeon, took such an active part in bringing the head of Charles I to the block that when, in 1660, Charles II came to the throne, they were forced to flee to America. Dr. Morris settled at Litchfield, Conn., and Colonel Phillips at Killingsworth, now Clinton, in the same State. In 1666 Dr. Morris became one of the first purchasers of Newark, N. J., where he was the first captain of militia and first sheriff of Essex County. His old friend, Colonel Phillips, soon purchased 900 acres of land at Caldwell, in Essex County, N. J. One of his grandsons, David Phillips, settled in Newark, where he married Sarah Morris, a granddaughter of Dr. Morris. He began house-keeping in a little one-story frame building, 10 x 16, which is yet standing. David Phillips ran a vessel between Newark and New York, and in 1696 the Proprietors of New Jersey deeded to him 16 acres of ground, which his grandson, who died in Newark on Friday, has left to his children. John M. Phillips's father had quarries at Belleville and Newark, and he supplied the stone for building Castle William, Fort Lafayette, St. John's Church and other buildings in New York. John M. Phillips quitted the little house in Newark 51 years ago. He was 16 years old, and only had 20 cents in his pocket, but he had a desire to make his way in the world. He learned the trade of pattern-making in Newark. Then he went to the West Point foundry, and thence to the Novelty Iron Works, New York. In 1845 he and the late Joseph L. Hewes began business at No. 60 Vesey street. A year later they removed to Newark, and in 1858 began making boilers, steam engines and machinists' tools. During the war they employed 500 men. They altered thousands of stands of arms from flint-lock to breech or percussion guns for New Jersey and the General Government. In 21 days they turned the turret rings and made a planing machine for planing the turrets of the Monitor. After Mr. Hewes died Mr. Phillips purchased his interest and became sole owner of the extensive works.

Although Mr. Phillips lived in one of the handsomest houses in Newark, he has religiously preserved the little house in which he was born and in which his father and grandfather died. His estate in Newark is so extensive that it makes 1 1/2 miles of street front in the loveliest part of the city. Mr. Phillips was a great reader, had a most remarkable memory, a wonderful power of description, and his knowledge had a wide and varied range. He never accepted office, but he was prominent in financial institutions, church work and charities.

Termination of Two Important Suits.

A suit resulting from a purchase of old rails was recently decided in Philadelphia against the Philadelphia and Reading Coal and Iron Company. On January 23, 1880, Clark, Post & Martin, of New York, made a contract with the company to deliver 5000 tons old iron "T" rails at \$43.50 per ton if delivered in Philadelphia, and \$1 less if delivered in New York. Shipments were to be made from foreign ports in the months of February, March, April, May and June of about 1000 tons per month, and payments were to be made in cash on the presentation of invoices and United States Weighmaster's return. Soon after this contract was made the company became very hard up for rails, and, in response to its urgent demand, a shipment was made of part of the rails in advance of the stipulated time. The company went into the hands of receivers on May 21, 1880, and default was made in payment for the rails shipped under the agreement. The receivers refused to take any more rails under the contract, and made a rather vague claim of a non-fulfillment of its terms on the part of Clark, Post & Martin. The shipments continued until June. The rails remained on the hands of that firm until February, 1881, when they were sold to the receivers of the Coal and Iron Company at a loss of \$70,000 to the firm. For this sum they brought suit in Common Pleas No. 4. On the trial of the case Judge Elcock charged that if certain of the rails were shipped in months earlier than those specified in the agreement, but in response to earnest requests for haste on the part of the company, the company were not now at liberty to object to the date of such shipments. The jury found a verdict of \$70,027.26 in favor of the plaintiffs.

Another suit decided in Philadelphia on the 12th inst. was the long-pending litigation of the Sulzbach Bros., bankers, of Frankfurt-on-the-Main, against the trustees of the Davenport and St. Paul Railroad Company, involving a claim of \$800,000. The court decides in favor of the entire claim, and orders that the estate of J. Edgar Thomson pay the entire damages. The complaint was filed against Andrew Carnegie, of New York, is dismissed. The Sulzbach Bros. brought the action in the form of an equity suit, as bondholders of the Davenport and St. Paul Railroad Company, to recover damages for injury suffered by them through the alleged overissue of bonds, in violation of the terms of the mortgage that they accompanied. The late Mr. Thomson and ex-Governor Dennison were trustees under the mortgage. The other defendants are alleged to have participated in the overissue of bonds. The overissue of bonds, it was contended, was the result of the negligence of Mr. Thomson as trustee for the bondholders. The court finds the overissue to be for the whole amount claimed by the complainants—namely, \$1,000,000. The Sulzbach purchased these bonds at 80 per cent. of their

face value; consequently, they make a claim of \$800,000 as the amount of damage they have suffered. The court, however, was of the opinion that the measure of damages was not to be calculated upon the percentage paid by the complainants for the bonds, but upon calculation as to what the bonds would have been worth and would have realized had the road been completed to an extent justifying the issue of the bonds and then been sold upon the failure of the construction company.

New Hardware Articles.

Piper's improved gentlemen's "Gem" carriage wrench, which is manufactured by Alcott & Smith, New Britain, Conn., and is now first offered to the trade, is shown in Fig. 1. It is intended for buggy and carriage use. This wrench is secured to the inside of the hub band by adjusting it so as to allow the two half-round cheeks of the frame and the stud of the slide to enter; the wrench is then pressed in as far as the parts will allow, and fastened with the thumb-screw. When thus fastened the nut can be unscrewed from the axle and screwed up by the wheel without



Fig. 1.

removing the nut from the hub. The advantages which such an arrangement possesses, as the operator's hands are not soiled by grease, nor is the nut liable to be dropped on the ground, will be readily appreciated.

Fig. 2 represents a new wagon and carriage jack which is made by the same parties under Arnold's patent. This jack is described as one that can be adjusted and operated instantly with one hand, since there are no springs or pins about it. It is made



Fig. 2.

entirely of metal—malleable or wrought iron, as most suitable—and is recommended as being symmetrical and durable.

The same circular describes Alcott's "Perfect" coat and hat hook, an article which has recently been put on the market, and is represented in Fig. 3. While there are many styles of hat hooks in the market, the superiority claimed for this is in the fact that from its form it holds any style of hat securely, so that it is not liable to be removed accidentally. This is accomplished by the

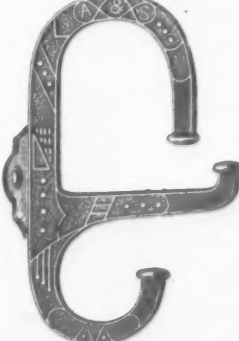


Fig. 3.

simple device of a depending arm, which is so constructed that it does not interfere with hanging up or removing the hat, but holds it in place, preventing accidental removal.

A hat-rack hook is made upon the same principle as the above, furnished with a tenon at top and bottom, so as to allow the hook to be turned in flush on the rack frame, for convenience in use as well as for close package in shipment. This hook was designed especially for the use of hat-rack manufacturers.

Information as to the trade prices on the above articles may be found in our Hardware Trade Report.

J. M. Jones & Sons, car manufacturers in West Troy, have made an assignment to E. C. White, of New York, with preferences of \$67,000 to M. M. White & Co., of New York. Assets not known.

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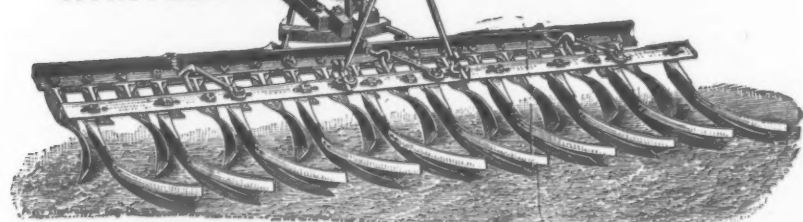
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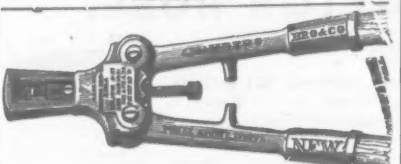
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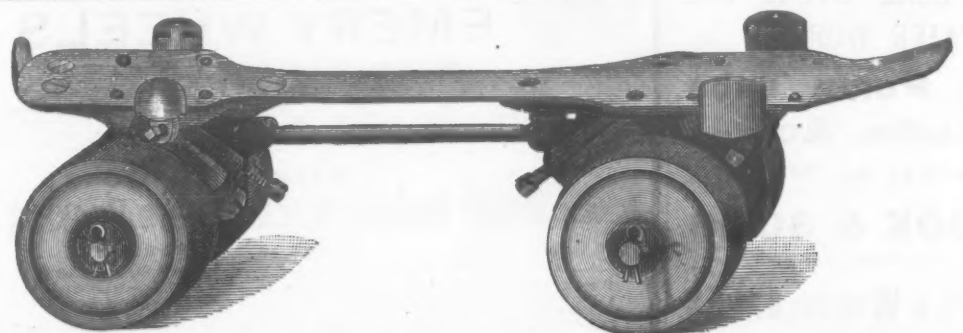
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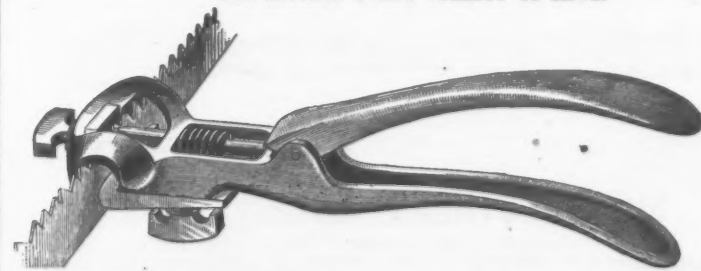
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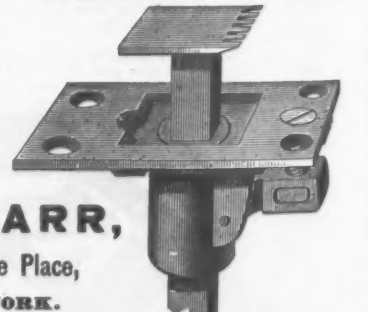
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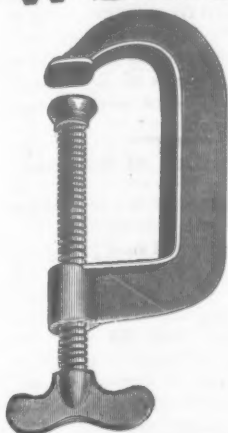
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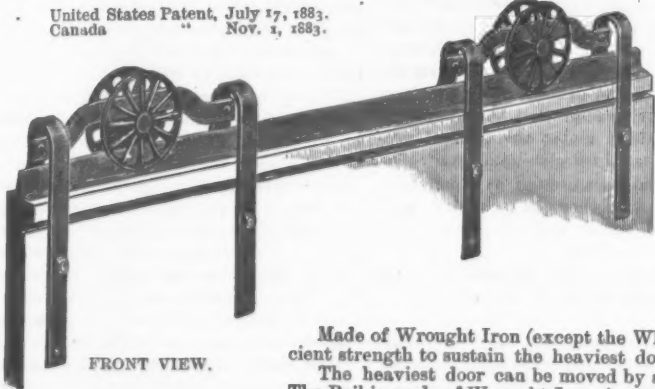
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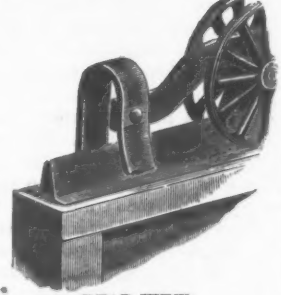
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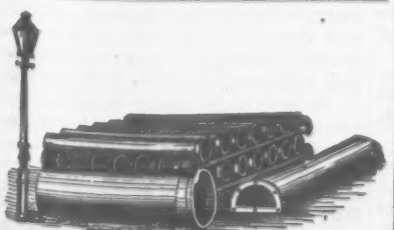
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Iron Ore Mining in Eastern Pennsylvania.

All along the Eastern Pennsylvania Railroad from Reading to Allentown, says a correspondent of the Philadelphia Press, there are a large number of iron-ore mines which flourish as the iron business is brisk or dull. The ore taken out is the ordinary hematite, which is brought in wagons to the ore stations along the railroad, loaded on cars and shipped to the various blast furnaces in Eastern Pennsylvania. The ore does not lie deep under the surface, and the various veins or pockets are worked by parties who lease the mines from the farmers who own them. The operators pay the farmers certain royalties per ton, frequently guaranteeing the mining of a certain number of tons of ore per month. In many instances the operators let the mining of the ore out by contract to their men, while others pay their hands so much per day. When the iron business was booming, some time ago, ore on the cars was worth as high as \$6 per ton, and laborers were paid as high as \$1.50 per day of 10 hours. Now, however, the iron trade is very dull; ore is as low as \$2.75 per ton, as business is slack. Laborers at the mines are paid as low as 60 cents a day for 10 hours' work. Some get 75 cents, and others 80 and 90 cents, but the average is about 75 cents. The operators say that unless they can get labor that cheap they can't mine ore profitably, and rather than lose money they will shut down. In many instances the laborers were told this, and it was left to them whether or not work should be continued. The poor miners decided to work for the merest pittance in order to keep the wolf from the door, and thus it is that they are working for such wages. The operators are fully aware that the wages are shamefully meager, but claim they cannot help it, owing to the general condition of the iron market.

Mr. James F. Dumm is one of the leading and best-posted iron operators in this section. He was asked what he knew on the wages question and the iron-ore outlook generally. His reply was: "I am paying 90 cents a day to my miners. They work 160 feet under ground and are expert men, who labor with the pick. I will not pay less for labor, although poor men have come to me who were idle and asked me for a job, agreeing to work for 50 cents a day. They are honest and want to do something."

"How do you account for such low wages?"
"It is certainly not the fault of the iron operators. We tell the men truthfully that we can't afford to pay any more, and I suppose other operators do the same thing. If the miners can't afford to work for such wages the mines must be shut down. Of course, in some sections operators can't afford to pay more than 60 cents per day, particularly where the royalties are high and the mines located a great distance from the railroads. The miners, in many instances, have large families to support, and, rather than be idle, they agree to work for whatever the bosses can pay. Some work under contract and others at so much per day."

"What is iron ore worth now?"
"For ore on the cars we get from \$2.25 to \$2.75, according to quality. A good deal of ore is sold for less than \$2.25. Now, there is very little, if any, profit to us on ore at those figures. The absolute first cost of getting out a ton of ore from the clay beds and washing it ready for market is from \$1 to \$1.50. We then have to pay to the owner of the mine a royalty of from 35 cents to 50 cents a ton; the ore must then be carted to the nearest railroad station or ore wharf, costing from 35 cents to 50 cents a ton; timbering a mine costs at the rate of at least 30 cents a ton, making \$2 for the lowest and \$2.80 for the highest per ton. The wear and tear of machinery at the washeries, incidental expenses, &c., go very far to increase the first cost of ore, so that by the time we get it loaded on the cars, what we get for it is a trifle, if anything, over the first cost. That is the reason men are paid as low as 60 cents a day."

Edward Sheets, of Reading, a gentleman who is extensively known in the iron trade, was next seen. He said: "When I first saw it published that ore miners were paid as low as 60 and 65 cents a day, I made up my mind to come out here among the miners and see for myself. I have found that there has been nothing overstated or overdrawn. Men are paid from 60 cents to 80 cents a day, but I don't care to say much how they live. I found a good many men, single, huddled together and living in shanties by themselves. They buy bread and potatoes at the railroad stations, and do their own cooking. They exist—nothing more; but their battle to keep body and soul together on 60 cents a day must be imagined; I don't care to describe it. It's a fact, though; no mistake about it."

A sub-boss who has worked on the Texas Flats, at Lower Macungie and other points, was asked to give an account how ore miners live on 60 cents a day in the open country districts. He said: "I have had considerable experience among men who live outside of the villages; miners who have families and who have worked for years on the Flats. They have seen good times and bad times. They have been paid \$1.50 a day, and all the way down to 60 cents, what they are getting now. Of course, they saved nothing at \$1.50 per day, because they had large families, and how they got along now at 60 cents a day is a mystery. Some have as high as eight children, but they average, say, four. They live in a rented house that may have cost a farmer \$300 to build. You can put up a rough one-story frame with a garret for that money, not counting the value of the ground on which it is built. The inside of the house will be well floored and plastered smooth, but it won't be whitecoated. It will have two rooms down stairs—a sort of front room or sitting-room and a kitchen. As to the sitting-room, probably one in 50 will be laid with rag carpet, and the kitchen floor will be bare. Mind, I am now trying to give you best picture I can. In the kitchen the cooking is done, and all meals eaten, excepting on special days, when the meal is spread in the front sitting-room. The garret may be divided into two parts, one for the children and the other for the parents, but very frequently all sleep together on the same floor. Now, as to the cost of their liv-

ing. An ore miner who gets but 62 cents a day, works from 10 to 12 hours per day, on such days as the weather is pleasant and work is to be had. Hundreds of the men work in the open air, because their labor is surface mining. When it rains they cannot work. If he works 20 days a month he is doing well, especially in the winter season. This will bring him in an income of \$12.40 a month. The farmer will get \$3 per month rent.

The miner then has \$9.40 for his month's work left. On this he must manage to subsist and also support a family of his wife and four or five children. For food alone his expenses for himself and family will not be 18 cents a day actual outlay. He has raised his meat, potatoes, vegetables, sauerkraut, &c., and his flour and store goods don't amount to more than 18 cents a day for the entire family. He has now about 12 cents per day left for clothing, shoes, taxes, coal, tobacco and incidentals, or, in other words, \$3.72 per month for that purpose. A miner will need a pair of brogans, costing \$1.25, every three months, together with overalls, &c. Deducting this, there will, on an average, be \$3 remaining a month, which the careful housewife takes charge of to clothe herself and children, buy coal, pay the old man's taxes and see that his box of shorts never gets empty. How she does it is a mystery which she only can explain.

The ore miner rarely has a Sunday suit, but it is quite the exception to find his wife or his children neatly dressed on the Lord's Day. If she is a good woman, herself and little ones will be clean and neatly dressed to go to Sunday-school when the weather is warm, and during four months in the winter two of the children at least will have boots or shoes and clothing warm enough to go to the cross-roads winter school.

His family knows nothing of luxuries and very little of books or newspapers. As for new bedding, furniture, home decorations or anything of that sort, they are entirely out of the question. Occasionally they have butter, fresh beef and eggs. During the winter the miner frequently traps rabbits on the hills with snares, or, if he is lucky enough to own a gun, and has money to buy powder and shot, he will be able to hunt enough game on Sunday to furnish himself and family with fresh meat for several days. Now, that is about how a poor and respectable miner gets along, who has lived in the country and is settled down. There are plenty of single men, foreigners, such as Hungarians and Poles, who live on boiled potatoes and molasses bread, and who do their own cooking in shanties; sleep in the clothes they wear during the day, and cover themselves with straw in the loft. Such a way of living is the worst I ever heard of, yet these foreigners save money. It costs them about 30 cents a day—hardly that. They are not naturalized, pay no taxes, buy very little clothing, eat coarse fare and drink black rye coffee. They send home \$15 every three months, the postmaster doing all their business for them. They have great confidence in the postmasters. In this way a Pole, by five years of toil and hardship, can send enough money home to enable him to go back home himself and live well on his interest."

The Union Pacific and Steel Rails.—President Sidney Dillon, of the Union Pacific Railway Company, says a Pittsburgh paper, was in the city a few days ago. The project which brought him is a big one. He was quietly investigating the subject of Bessemer steel rails, both the cost aboard cars and the cost of manufacture. His plans contemplate the erection of a Bessemer plant larger than the Edgar Thomson for the exclusive manufacture of steel for steel rails, structural purposes and for engine and car building. The result of the investigation was the deferring at present of the active prosecution of the work. Mr. Dillon was interviewed on the subject. He said that the present state of the market made it possible to buy rails as cheaply as they could be made anywhere, but that his company did not expect present prices to rule long, and they could at least save the hauling by making their own rails. "Our road," said Mr. Dillon, "will use our entire product. We will make our own rails, our own bridge and culvert steel, and pretty soon we will make our own cars and locomotives." The orders for machinery, furnaces, &c., will be placed in this city shortly.

With reference to the conveyance of motive power to long distances by electricity, M. Le Blanc suggests that rivers should be regulated by the construction of reservoirs capable of storing immense quantities of water in time of flood, so that it may be utilized in a variety of ways when the river subsides. He shows the prospective advantages of such a plan to agriculture, and the possibility of working farms on the new system inaugurated by M. Marcel Deprez. The rainfall in France is equivalent to 399,500,000,000 m. of water per annum, of which 190,000,000 run to the sea, the rest evaporating. Striking an average, he finds that such a stream, now running to waste, represents a force of 10,000,000 horse-power, or, in other words, the work produced by an annual combustion of 100,000,000 tons of coal. By storing so much power, and utilizing it by electricity whenever required, and at the mere cost of the installation of conductors, farmers would till their fields by the same force which had previously devastated them.

The annual report of the San Francisco Board of Trade is favorable. From it we learn that the prospects of an increased and remunerative business are, to say the least, encouraging. New industries are everywhere springing into existence. Manufactures are steadily increasing and expanding, and the people are every day becoming more and more independent of foreign markets, while the steady influx of industrious laborers from the East and Europe increases the consumption of all kinds of merchandise and gives a ready market for products of farms and factories. Exports promise to increase rapidly during the coming year, and confidence is felt that the merchants of San Francisco can secure the greater proportion of the trade of the western States of Mexico and of those portions of the Republics of Central America situated on the Pacific.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, February 21, 1884.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. HAYLES, Editor.
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Concerted Restriction of Production.

Europeans are accustomed to criticize American manufacturers for their disposition to act in concert. Combinations of all sorts are quite common on this side of the Atlantic, and there are very few branches of manufacturing industry in which at some time or other an organization to control prices or to regulate production has not had an active and potential existence. In some staple lines, of course, such as pig and bar iron, it has not been practicable to form a combination, and prices and production have varied according to the fluctuations in the demand. It cannot be charged that organized action among iron and steel manufacturers has often been undertaken for the purpose of securing unreasonable profits. The usual motive for concert of action is to prevent prices from declining to actual cost or below it. Possibly this may sometimes result in the maintenance of prices in a particular branch of trade at a point which makes its remunerative condition very conspicuous, as compared with other branches in which competition is wholly unrestrained and prices leave no margin above cost. A combination which accomplishes such an effect is especially severely criticized by British manufacturers. Recent events in England show, however, that there is a decided inclination to adopt such a policy in several branches of the iron and steel trades, which are now and have for some time been suffering from very great depression. Curiously enough, the leaders in the movement are the pig-iron and steel-rail manufacturers.

About three years ago the North of England and the Scotch furnacemen jointly agreed to restrict their production 12½ per cent. for a specified time. The compact was kept and prices were held reasonably firm. Since the expiration of the time covered by the agreement production has not been limited in any way and prices have ruled unusually low, the average price of Scotch warrants last year having been lower than for any year of which we have knowledge, our reports going back to 1863. In the North of England the manufacturers declare they are selling pig iron at or below cost. It is surprising that failures have not been numerous in that great iron-making district, but there are grave apprehensions of trouble if the situation is not speedily cured. As the prospect is not bright for an increased demand from the consumers of their pig iron, the Cleveland manufacturers have agreed to blow out 18 furnaces by

the first of March, and to keep them out for a year, which is equivalent to 15 per cent. reduction in the total output. No arrangement has been effected with the Scotch pig-iron makers, but they are restricting their production independently and irregularly. Messrs. Wm. Baird & Co. have alone blown out 10 furnaces already. This action has caused the price of Scotch and Cleveland pig iron to advance moderately. Time will show whether the production has been sufficiently restricted to secure permanent improvement in prices, but the restrictive policy has been fairly inaugurated, much to the dissatisfaction of some manufacturers who would prefer to let matters take their course without let or hindrance.

In the British steel-rail trade it is understood that the manufacturers have determined to restrict production at least 20 per cent. Full particulars of this agreement have not yet been made public, but there is reason to believe that the German and Belgian steel-rail manufacturers have been induced to co-operate with the English. Some color to these reports is given by the recent advance in British steel-rail quotations. These are now £4.15/6 @ £5, as against £4 @ £4.10/2 two weeks ago. It is not believed that the demand has increased sufficiently to warrant this advance, which has presumably been brought about by the action of the makers with regard to restriction of production.

The tendency to curtail the excessive output of iron and steel is also manifesting itself among the German iron manufacturers. It is stated that the Silesian iron manufacturers have agreed to reduce their production 10 per cent.—and eventually, if considered necessary, 20 per cent.—on condition that the other groups of German iron manufacturers in Saxony and Bavaria have adopted a similar resolution, but the adhesion of the Rhenish-Westphalian and Saar-Moselle producers has yet to be announced. The principal German coal owners are also making an effort to secure concert of action in reducing the output of coal.

The Ohio Valley Floods.

The disastrous overflow by the Ohio River a year ago was a calamity which nobody expected to see repeated inside of at least a quarter of a century. The water then rose to such an extraordinary height at Cincinnati that the flood seemed to have the nature of a phenomenon, brought about by a concurrence of causes which could be expected to happen very rarely. Such a presumption seemed the more reasonable when it was ascertained that the flood of 1883 had not been approached in magnitude since 1832, more than 50 years before. The citizens of the Ohio valley could, under such circumstances, be totally relieved of the charge of heedlessness in reoccupying the territory which was so terribly water-swept last year. They could not be expected to foresee a repetition of the calamity inside of a twelve-month, when so many years had passed without danger. Yet it came, and for the past two weeks the people of the Ohio valley have been suffering from a visitation of waters which surpasses anything ever before experienced in that section. From the head waters of the Ohio in Western Pennsylvania almost to the point at which that river is lost in the mighty volume of the Mississippi, towns and cities have been laid waste, prosperous villages have been swept out of existence, ancient landmarks have been obliterated, and a thrifty farming population have been reduced to barest want.

The loss of property throughout this vast stretch of territory has been immense, aggregating many millions of dollars. These losses are absolute. They are not like those inflicted by fire, much of which may be made good by insurance companies. That which the floods have destroyed is without any such hope of relief. But above and beyond the wasted fields, the ruined homes, the wrecked workshops and the stricken towns, is the loss of human life which inevitably accompanies these extraordinary freaks of nature and adds the tragic to the sublime. It is a great relief to know that the worst is past and that the waters are receding rapidly. Tidings from many places report "the river is within its banks." But the effects of the flood do not disappear as rapidly as the waters recede. For days we will hear of the ruin that has been wrought to furnace and factory and mill, to farm and village and city, and we will also hear of the distressful state into which many industrious citizens and their families have been suddenly plunged. The cry for assistance is not, however, heeded, but the Government and the people are contributing liberally to the aid of the Ohio Valley sufferers, and food and clothing are being sent to them in abundance.

As soon as the river again resumes its natural channel there will be plenty of work to be done in repairing the damage wrought by the water, and labor will evidently be in great demand. Those who are now idle perforce and dependent upon charity will not be obliged to continue long in that condition. The news from Pittsburgh is to the effect that the iron, steel and glass works there are generally resuming operations this week, having already "cleaned up." Wheeling suffered greatly, the whole city having been under water, but we are prepared to hear soon that her citizens have, with their accustomed energy, repaired the damages wrought to their iron and glass works and are going ahead again. From points lower

down on the Ohio progress in the resumption of work will be slower, because the flood has been longer in reaching its height and later in receding, but days will not run into many weeks until from Portsmouth, Ironton, Cincinnati, Newport, Covington, Louisville, New Albany and Evansville the news will come that the effects of the flood have been overcome and old-time activity again reigns.

The citizens of the Ohio valley realize that it will not be prudent simply to repair the damages caused by this flood and to trust to nature again. At Cincinnati, even while the water was at its highest, a meeting of the Chamber of Commerce was called, and a committee was appointed to consider the most feasible method for raising the "bottoms" above high-water mark. Other towns and cities are considering the same question, and various measures for avoiding disastrous consequences from future floods are being discussed. Immense levees are proposed, such as those on the lower Mississippi, while some advocate the construction of huge reservoirs in the mountains to contain and hold in reserve for dry seasons the winter and spring rainfall which causes these floods. In the midst of the uncertainty as to the best means of directly and immediately preventing another deluge, one point seems to be pretty thoroughly agreed upon, and that is that the forests about the head waters of the rivers which empty into the Ohio should be restored. This is a remedy which will have to be taken in hand by the nation itself, if it is to be adopted, as the affluents of the Ohio rise in many States.

The Position of Tin Plates.

The year opened with ordinary brands of coke tin at \$4.90 per box, and remained steady for about three weeks, when a gradual decline commenced, depressing it to \$4.70. This decline, so far as we are able to judge from general facts bearing on the question, is due rather to fiscal causes—namely, the anticipation of a reduction of the duty—than to commercial ones, such as demand and supply. From a commercial point of view tin plates do not appear to be in an unsound position. The general export from England in 1883 shows a moderate increase, keeping pace with the ordinary increase of consumption abroad. It was 277,300 tons in 1883, against 265,021 in 1882, and 243,381 in 1881. The net importation into the United States during the first 11 months of 1883 was 206,459 tons, against 197,326 in 1882; into New York alone the import in the whole of 1883 was 2,193,978 boxes, against 2,265,033 in 1882, thus varying but little, and present stocks in port and in the interior nowhere show greater accumulation than usual at this time of the year. Consumption must, therefore, have been steady; judging from the exports of tinware and canned goods, as shown in the table given below, home consumption must, indeed, have varied very little:

Domestic Exports of Tinware and Canned Goods During the First Eleven Months.

	1883.	1882.
Blacking	\$189,602	\$177,407
Farina, maizena, &c.	1,398,420	549,063
Tin toys	694,435	784,016
Preserved fish	1,081,309	1,218,305
Preserved fruit	480,754	620,266
Gunpowder	2,26,207	435,590
Honey	47,598	47,710
Lard oil	459,955	349,198
Petroleum	35,554,733	35,419,130
Lubricating oil	2,010,879	1,752,708
Fats	451,042	436,417
Condensed milk	25,992,508	24,714,577
Spirits of turpentine	184,524	153,047
Tin manufactures	3,891,086	3,970,796
Various	188,662	189,024
Total	\$72,712,991	\$70,969,203

The above table includes a portion of some articles not canned, but enables us to form a general idea of the movement in this branch of trade.

The statistical position of tin plates being considered sound on this side, and the anticipated reduction of the duty discounted by the decline since January 19, it is believed that they have about touched bottom, the more so as they are really cheap, and this cheapness is calculated to stimulate their use. Much will, of course, depend upon the spring trade, and, later on, on the prospect of the fruit and cereal crops, &c. The general outlook for tin plates, considering all circumstances known at this writing, has in it much to encourage the conviction that they are tolerably safe as at present situated. In Wales the bulk of larger makers have booked orders for a couple of months ahead, so that prices are kept down in that locality mainly by the financial necessities of small makers and the dull accounts from here, and not by an excessive output seeking purchasers. It is worthy of remark that the consumption of tin plates, whatever the times, has at no period that we know of been seriously checked in this country for 10 years past.

The Ways and Means Committee of the House of Representatives are engaged in the consideration of the Morrison tariff bill, and hearings have been granted to several of the industrial interests affected by tariff legislation. On Saturday, representatives of the metal trades appeared before the committee and their statements and arguments occupied the entire day. In another part of this issue we print an account of the proceedings on this occasion, furnished by our Washington correspondent. The committee express their willingness to receive and consider other information besides that given them at these hearings, and to that end manufacturers are asked to send in writing any information they may desire to place before the com-

mittee, and to answer the following questions: Where is the competing article produced? Price per unit of quantity produced? Cost of ocean transportation? Price of the domestic article? Cost of production? Wages paid per capita? How many days, weeks or months in the last year the works have been stopped, and the cause? How many and what changes in rates of wages have been made in the last year?

An Old Acquaintance.

Among the decisions in customs cases which were rendered by the Treasury Department during the week ending February 9, appears one affecting the duty on chains. An attempt has been made at Chicago to get chains of the class charged with 2½ cents per pound duty admitted by the customs authorities at the ad valorem rate of 45 per cent., on the ground that they were made to special lengths, and were not adapted to general use, and were, therefore, "manufactures of iron not otherwise provided for." The decision rendered was not in favor of the ad valorem rate, but imposed the specific duty.

The officials of the Treasury Department must be very familiar by this time with the principle involved in this appeal for a decision. Several years ago an attempt was made to import "cut hoops" at an ad valorem rate of duty, on the ground that they were not enumerated in the tariff laws and were not to be considered technically as hoop iron, inasmuch as they were cut to length for a specific purpose and could not be used without waste for general purposes. Quite a controversy arose over this question, but the department at length ruled that cut hoops were subject to the specific hoop-iron duty, although the officials were strongly inclined in the beginning to admit them at the ad valorem rate. Tank plates were also sought to be introduced as non-enumerated manufactures of iron, when imported cut to a particular size and fitted to be made into tanks without further trimming. Car-truck channels followed in the same path, being composed of channel iron cut to the exact length for a car truck and drilled for the necessary bolts. The importers claimed in both these cases that the cutting to length and fitting for a special use of the plates and channels so changed their character that they were not properly classified under the general provisions of the tariff for plate and other rolled iron, but should be admitted as "manufactures of iron not otherwise provided for." Their views, however, did not prevail with the Treasury Department.

After so frequently passing upon this principle, it is remarkable that the department should again be called upon to decide it. The chain question seems to be identical with the cut-hoop, tank-plate and car-truck channel appeals, and has been decided by the Treasury Department in exact conformity with its previous rulings.

Ocean Steamship Profits.

The steamship companies in our Transatlantic trade complain more loudly than ever of the small profits derived from their business. Rates of freight for months past have ruled lower than ever before. Besides, the emigrant passenger business has materially fallen off. More than all, when ever for a brief period the state of the American markets favors an export trade in grain, hundreds of the cheapest class of freight steamers, known as "rovers" or "tramps," rush in to seize the prize. Inquiries among the various local agencies of freight lines evoke the uniform reply that dividends on ocean steamship stock are reduced to a minimum, and the reason assigned is that too many steamers have been built. Tempted by cheap money in the English market and facilities for placing stock among country people who were prepared to make small investments, the builders on the Clyde and Mersey have overstepped the mark.

There is a difference of opinion respecting the comparative value of slow steamships, some affirming that this class are a source of loss rather than profit, which the swifter class are expected to recoup. At the same time, the fact cannot have escaped attention that the elegant "seven-day" steamers are the first to lay up. The truth appears to be that it is impossible for all the ocean tonnage afloat to find profitable employment except in the most prosperous times. The building of steamers has been badly overdone, as the Clyde builders have found out to their cost, while the owners of sailing vessels consider themselves privileged if permitted to live.

It must be remarked, however, that the withdrawal of steamers from active service in consequence of lack of employment is already having an effect on freight rates between New York and certain Scotch ports. West-bound cargoes are not now taken on the low terms which ruled up to a couple of weeks ago. Forward contracts for March and April cannot be made except at materially higher figures. Importers of Scotch pig iron are keenly alive to the changed condition of affairs in their trade since so many vessels have been taken off, and freight room to this port has been restricted within very narrow limits.

High feeling exists in the Dominion, arising from the alleged efforts of the Grand Trunk Railroad managers to secure legislation in the Dominion Parliament inimical to the interests of its new rival, the Canadian

Pacific. All at once, many newspaper columns are occupied with the discussion. Charges and counter charges are very bitter. It is alleged to be the height of presumption on the part of the Grand Trunk, which owes the Government \$20,000,000, on which no interest has been paid, to use its influence for the defeat of a project closely identified with the interests of the entire country, especially the great Northwest. The policy adopted by the former is said to be "rule or ruin." Rival lines must be operated in the interest of the Grand Trunk. All competition must cease. Public money must not be loaned to build up opposing interests. In response to these claims, the declaration is made that neither Parliament nor the people can be "dragoned" into compliance with demands so preposterous, nor will the people consent to a huge monopoly covering the entire Dominion. The intimation from a high source that the Government may have reason to dread the power wielded by the Grand Trunk in England and elsewhere excites only feelings of derision. In the United States some will think they find in the revelations now made a clew to the many disquieting reports recently furnished from Ottawa to the New York press. The credit of the Dominion and its banking institutions, as well as the state of trade, the prospects of Manitoba, &c., have all been subjects of severe animadversions.

The Condition of Business.

Business generally is not in a very satisfactory condition in this locality. The demand for most iron and steel products is not what it should be, while prices are exceedingly low. In every direction complaints are rife of the unprofitableness of manufacturing operations, and the establishments which are able to "make both ends meet" are not numerous, if common report can be believed. Nor is this condition of affairs confined to manufacturers of the cruder forms of iron and steel; it is true as well of establishments which convert the products of the blast furnace and rolling mill into finished forms. But the unsatisfactory condition of affairs does not cause the complete cessation of work. Here and there is an establishment which has found it utterly impossible to run any longer, and it has, temporarily we may hope, dropped out of the race. Those which continue at work may be regarded as the best equipped, the best located or the best managed works. In order to keep them in operation their owners are obliged to practice every economy, and to watch closely all the details of their expenses. A very much closer calculation than ever before is now being made of the number of men actually required to perform a given amount of work, and if it is ascertained that even one man can be dispensed with, he "must go." Labor-saving appliances are more in request than ever under such circumstances. Recently we have been informed by a mill owner that, in studying the arrangement of his plant with a view to securing still greater economy, he observed a case in which, by the construction of a simple overhead tramway, he was enabled to dispense with four or five men who had previously transported in barrows what one man could easily shift by means of the tramway. This is only one out of many such instances.

Dull times, low prices and unprofitable business bring with them some little compensation in the fact that they stir men up and cause them to think vigorously what they can do to improve their plant or to make their methods more effective. If work were always abundant, and manufacturers were always pushed, and they always got good, remunerative prices for their products, it is questionable if the plant or the methods or the product would ever be radically improved. They would not need it. Manufacturers operate their works for profit, and when profits cease they then look about them to determine how the situation can be made better. The pressure of our present hard times is visibly diverting a number of establishments into channels which their owners would not have selected if trade had continued prosperous. This is manifested in the growing tendency to substitute steel for iron. As the demand for steel seems to be taking deeper root among those who have heretofore been consumers of iron, the iron manufacturers themselves are preparing to supply the growing demand. Those who do not have steel-converting plants are purchasing billets and rolling them to shape in the mills in which they formerly rolled iron. Some of these manufacturers who now roll steel are, however, purchasing their billets abroad, one of them having recently ordered 1000 tons for this purpose. This feature of the newly-developed branch of the steel trade cannot be a pleasant one for the contemplation of American steel manufacturers. They certainly ought to be able to furnish all the steel needed in this country. The price of foreign billets is very little below that of domestic billets, and our manufacturers should meet it and thus secure the demand which is now springing up and bids fair to become an important element in supplying the needs of the country.

We present in another column a copy of a resolution concerning compulsory examination of stationary engineers in Philadelphia, recently brought before the Franklin Institute of that city by Mr. John W. Nyström. As stated in the article, the committee appointed to investigate and report upon the question were of divided opinion, the majority

not deeming it advisable to ask for the passage of an ordinance requiring persons who have charge of engines to pass an examination and be licensed by a board. It was argued, among other things, that the qualifications of an engineer could not be determined by a board of examiners; that, as the examinations would necessarily be all ways on the same few points, incompetent candidates might become possessed of property of the correct answers to the questions, and thus receive a license; that, furthermore, the passage of such an ordinance would create a privileged class of men with power to fix their own wages, regardless of the value of the service rendered, and also that in case of an explosion the responsibility might be removed from the proprietors of the boilers and placed upon the city. Though perhaps not all strictly in accordance with the experience of many, the objections urged against examining and licensing engineers are by no means to be ignored, and reflect severely upon the possibilities of such a course. Mr. Nystrom's plan undoubtedly has numerous commendable features, and, if properly carried out (this special point, however, giving rise to grave doubt), would work in the most satisfactory manner. As it is, there is reason to suspect a lack of conscientious work in the matter of examination, and the latter would, therefore, perhaps scarcely guarantee competency on the part of the licensed engineer. Without the ordinance steam users, in case of explosion, may be held directly responsible for loss of life or damage to property, while the adoption of the ordinance would very probably offer a convenient means of escape from the penalty attached to gross mismanagement and working under conditions known to be dangerous.

A Noteworthy Policy.

Prominent among the employers of labor in the United States, by reason of the efforts they make to advance the condition of those who are so fortunate as to be in their service, stand the firm of Messrs. Carnegie Bros. & Co., of Pittsburgh. The liberality of the individual members of this firm is well known. Mr. Andrew Carnegie has been a public benefactor in both Scotland and the United States, and his firm have done nobly in providing elevating and refining influences for their workmen, by establishing reading-rooms to which they can resort for intellectual entertainment. Quite recently a system has been established at the Edgar Thomson Steel Works, by which industrious and frugal workmen will be assisted to secure homes for themselves, and arrangements have also been made to furnish them the necessities of life at reasonable rates. The workmen in the employ of this great establishment are now free from the incubus of extortionate prices for rent and food, and their condition has been made much more tolerable than is usually the case. Another instance of striking liberality has just been received.

It gives us great pleasure to announce that Messrs. Carnegie Bros. & Co. have recognized in a very acceptable manner the services and merits of three more of their young men. The firm have admitted as partners, to date from the 1st of January, Messrs. Wm. L. Abbott, S. E. Moore and William Bontraeger. Messrs. Carnegie Bros. & Co. have set aside equal shares for these young men, and will charge interest upon their value, allowing all profits and also the savings of the parties to go toward the payment of the debt. In a few years, with the extraordinary success attending the firm in the future which has characterized the past, their shares will become the unencumbered property of the persons named.

The history of these three men is remarkable. Mr. Bontraeger entered the service of the firm when a German lad able to speak only a few words of English. He was paid \$25 per month for his services. By his great ability, untiring industry and devotion to the interests of his employers, which knew no bounds, he rose to be manager of the iron mills, and now takes his place as partner. Mr. Abbott has a history akin to this in the commercial branch of the business. He rose to be traveling agent and then was placed in charge of the office business. Now he enters the firm. The third new partner, Mr. Moore, has had charge of the accounts of all of Messrs. Carnegie Brothers' various enterprises, and although only acting as auditor, he developed rare ability beyond his immediate department. It is believed that the strict system of accounts always insisted upon by this firm has developed under Mr. Moore's direction into one of the most perfect known. It has been the policy of Carnegie Bros. & Co. to promote their men, making ability and character the only test, and the *esprit de corps* which is found among their employees is the result. A very high standard, no doubt, is required. Such prizes as Messrs. Curry, Bontraeger, Abbott and Moore have won come only after many long years of exceptional service, but that they do come at last is creditable alike to the firm and the recipients, and must encourage others to exert themselves as they have done.

Hayti is passing through a "baptism of blood" more sanguinary than open warfare. In stamping out the embers of rebellion, President Salomon and his supporters, or, rather, the adherents of the Government, are actuated by a vindictiveness rarely paralleled, and, as the defeated insurgents are to a considerable extent mutilated of the mercantile class, the trade and industries of the country suffer from social disorganization, notwithstanding the cessation of hostilities and restoration of the ports to Government control. Captain Pearce, of the *Atlas* line of steamers, who recently returned from a voyage around the island, expresses a belief

that Hayti's future is destined to be more prosperous than its past. It is remarked that this is the first revolution on the island which was not successful. The fact that President Salomon is an educated man is also commented upon favorably. Other hopeful signs are the friendly attitude of the agricultural classes toward him and the excellence of this year's crops. The merchants are said to have been opposed to the Government because it would not allow foreigners to own land in Hayti. Captain Pearce is of the opinion that the coffee crop this year will be enormous, and that as soon as the natives in the interior are satisfied that the war is over they will bring such quantities of coffee into the seaport towns that for a time it will be impossible for the vessels to carry it away. The custom houses at Miragoane, Jacmel and Jeremie were expected to be reopened on February 14. The United States have heretofore had in the black Republic of Hayti a very good customer.

The Hudson River Tunnel, which for a time formed a topic of no little discussion has of late attracted very little attention in a general way, work having been discontinued until arrangements can be effected to complete it without further interruption. Mr. Haskins, manager of the work, in a recent interview stated that lack of funds is now the main difficulty opposing further operations, and that what has already been accomplished disproves the assertion made some time ago that it was impossible to successfully go on with the work. According to Mr. Haskins, it will take \$5,000,000 to complete the tunnel and the approaches, and with steady work the north tunnel could be completed in 15 months, while the entire work, including the approaches, would occupy about two and a half years.

Consul-General Denny, at Shanghai, reports a serious falling off in the exports of raw silk to the United States, due partly to the spread of disease among the silkworms, but perhaps more to the steadily increasing competition of Japan, whence our manufacturers obtain a better article. In the cotton-cloth trade, on the contrary, the United States are obtaining a larger share, while England is losing her grip. In both cases "honest" goods are at a premium. New York shippers via the Suez Canal say they are doing a larger business, but the rates of freight are not remunerative.

English papers notice the increasing proportion of cargo steamers lost at sea since it became difficult to sail them profitably on account of unprecedently low freights. New vessels, highly classed under the survey, go down along with the older and weaker ones. It is shown that a steamer of 4000 tons going out from London to an East Indian port may founder in the Bay of Biscay and leave the owner richer by \$100,000. Some restriction must be devised to prevent overloading and over-insurance. A movable "Plimsoll mark" amounts to very little.

Pittsburgh, according to the statements of one of the burglar fraternity, now makes the best "safe-cracking" tools in the world, surpassing those of Sheffield, England, whence they were formerly obtained. The assortment includes extension bars, hair-spring saws, bits and drills. A saw capable of going through a piece of merchant bar iron 1½ inches thick in a few minutes is described as "so small that you could about hide it under your thumb-nail." Notoriety on account of success in this line of manufacture is not altogether desirable.

Report of the Gun-Foundry Board.

The board of army and navy officers appointed to examine and report which of the navy yards or arsenals has the best location, and is best adapted for a Government foundry and for other purposes, has made its report. The board visited the leading countries in Europe to ascertain the methods used in reaching the required results. It finds the plan adopted since the Franco-Prussian war in France perfect in theory. By it the Government gives assurances to private companies which induce them to expend the funds necessary to erect new and suitable tools. Under the arrangement the private companies assist up to a point justifying on their part a reasonable outlay of money for a plant, and the Government, though working in this common field as well, yet reserves to itself all the more onerous charges involved in the manufacture of the heaviest ordnance. Mutual checks exist which prevent one party imposing on the other. The board approves the proposition "that the Government should establish on its own territory a plant for the fabrication of cannon, and should contract with private parties to such amounts as would enable them to supply from the private industries of the country the forged and tempered material." It recommends that the Watervliet Arsenal, West Troy, N. Y., be selected as the site for the army-gun factory, and the Washington Navy Yard, District of Columbia, as the site for the navy-gun factory. The following is submitted as the approximate cost of foundry plant:

Casting.....	\$250,000
Forging (hydraulic press).....	150,000
Tools to rough bore and turn.....	210,000
Tempering.....	50,000
Total.....	\$660,000
Additional cost if liquid compression be adopted.....	175,000
The approximate cost of gun-factory plant is figured as follows:	
Guns up to sixth caliber.....	\$50,000
Guns from sixth to twelfth caliber.....	150,000
Guns from twelfth to sixteenth caliber.....	350,000
Buildings and shrinking pit.....	850,000
Total.....	\$930,000

The report says: "Three years will be required to complete the tools, construct the shops and establish the plant. Such a factory will turn out per year 50 6th, 17 12th and 12 16th guns, or a proportionately larger number of smaller calibers, at a yearly expense of about \$2,000,000."

Mr. Hewitt on the Tariff.

The following letter was sent by Hon. Abram S. Hewitt to the Trenton Board of Trade, in reply to an invitation from them to respond to the toast, "Our Manufacturers—the capital, skill, brain and labor thus employed owe much of our local prosperity," which was proposed at their annual dinner, held in Trenton on the evening of the 14th inst.:

I regret exceedingly that my duties in Washington will make it impossible for me to be present on the occasion. I regret this the more because it would afford me a convenient opportunity for disabusing the public mind of some prejudices which have been sedulously instilled by interested parties as to the effect of my views in regard to the reformation of the tariff. The industries of Trenton are suffering from useless obstructions imposed by the existing tariff. I seek to remove the obstructions in order that the capital and labor employed in branches of business affected by them may have steady and remunerative occupation, which is now impossible. The removal of the duty upon scrap iron, for example, which benefits no existing industry whatever, would enable every idle train in Trenton to be run day and night, and the money which is now paid for foreign rods would be largely distributed among the workmen of Trenton, who are now condemned to idleness through no fault of their own, and every business interest in the city would flourish in a corresponding degree. If the protective system be the panacea for all the suffering of the workmen and the want of remuneration of capital, how comes it to pass that at no time in its history were the industries of Trenton in so unpromising a condition as they are at the present time? The truth is, they are taxed out of existence, and the workmen lack employment because they have not yet learned the bitter lesson that every dollar of taxation imposed by law is deducted from earnings which otherwise they would have for the support of their families. I do not wonder that the artisans of Trenton do not yet appreciate the evil effect of obstructive duties, when I reflect that for the greater portion of my life I was myself deceived as to the effect of such duties, and have been brought to my present conclusion only after an experience as convincing as it has been disagreeable.

WASHINGTON NEWS.

(From Our Own Correspondent.)

WASHINGTON, D. C., Feb. 20, 1884.

On Friday, February 15, the representatives of the iron and steel industries who had arranged to appear before the Committee on Ways and Means in defense of their interests against the effects of the "Morrison tariff" bill arrived in Washington, and the same day held a meeting for organization and the preparation of work. This meeting represented 80 furnaces and ore firms in the States of Pennsylvania, New York, New Jersey, Ohio, Michigan, Wisconsin and Maryland. Mr. B. F. Jones, of Pittsburgh, was chosen chairman and Joseph D. Weeks secretary. A committee consisting of Messrs. Cyrus Elder, Joseph Wharton, J. G. Butler, Jr., Mark Hanna and Wayne McVeagh was appointed to prepare a formal protest. At a meeting held on Saturday morning the protest was formally read and approved, after which the committee adjourned to the room of the Committee on Ways and Means.

Shortly after the hour named for the hearing, 10 a. m., a quorum of the committee had arrived and was called to order by its chairman. There were present Messrs. Morrison, of Illinois; Mills, of Texas; Blount, of Georgia; Jones, of Texas; Herbert, of Alabama; Kelley, of Pennsylvania; McKinley, of Ohio, and Hiseock, of New York. Later, Messrs. Hewitt, of New York, and Hurd, of Ohio, joined the committee. The committee room was uncomfortably crowded. The chairman then announced that the committee were in readiness to hear what the gentlemen had to say. Mr. Jones, chairman of the united interests of iron, steel and ore before the committee, advanced, and, after a few brief remarks of a general character, read the following protest of iron and steel manufacturers and iron-ore producers against the enactment of the Morrison tariff bill:

To the Committee of Ways and Means of the House of Representatives of the United States: The undersigned, representing producers of iron ores and manufacturers of iron and steel, submit this, their protest, against the enactment of the bill known as the Morrison tariff bill, now under the consideration of your committee, with our reasons for said protest:

1. Because of the effect that any reduction of duties must have on labor. The iron and steel business of the country yields to day little or no profit on the capital invested. If the duties are reduced, the selling price of our products must be reduced to compete with the foreign importations. To accomplish this the cost of production must be reduced accordingly, and such reduction must come out of labor. We do not say this because we desire it, but because necessity will compel it.

2. Because a sufficient time has not elapsed since the act of 1883 took effect to ascertain what the consequences of that act will be, or to determine, if a necessity for change exists, in what part of the law the change should be made.

3. Because it will not accomplish the reduction of revenue which is sought. Experience has shown that the effect of reductions similar to those proposed in this bill has always been to stimulate importations, and, consequently, to increase the revenue.

4. Because of the extreme difficulty of its correct interpretation. The plainest and most simple tariff law is at best difficult of interpretation and application, but under the complex system of levying duties provided by this bill, as in the metal schedule, in which four different standards may be applicable to each importation, it is evident that the difficulties will be increased, not simply fourfold, but many fold.

5. Because of the extension of the system of compound duties. The iron trade has always objected to this system. It has constantly favored specific duties in place of ad valorem; but this law, while it ostensibly retains specific duties, applies to every article

in the metal schedule an ad valorem rate in its most obnoxious form.

6. Because of the great inducement it offers to undervaluation and frauds on the revenue. The provision that no article in the metal schedule shall pay over 50 per cent. ad valorem is a distinct invitation to such fraud is greatly increased by the four standards of comparison before referred to, viz., the act of 1883, the 20 per cent. reduction of the present bill, the provision that the duty shall not exceed 50 per cent. ad valorem, and the act of March 2, 1861.

7. Because of the effect on business that the agitation of this subject will produce. There are already sufficient elements of disturbance and depression in our business without introducing another, the evil effects of which no one can foresee.

In conclusion, we protest against this bill because it apparently indicates the purpose of imposing, permanently, European conditions of labor upon the workmen of this country, conditions against which foreign laborers revolt, and which they seek this country to escape. The maintenance of an American scale of wages for American workmen is essential to the good order of our society, the stability of our institutions, and the general prosperity of the country; and this involves the maintenance of the American policy of protection to home industry.

[Signed by 113 iron, steel and ore-mining companies and firms.]

Joseph Wharton, of Pennsylvania, was then announced as the first speaker. He said he regretted the necessity of appearing before the committee so often. [The chairman, Mr. Morrison, interjected the remark that if he had anything to say, it would not be the last time. Major McKinley, also a member of the committee, said: "As long as Colonel Morrison is here you will be compelled to come." Mr. Wharton then resumed. He said that there had not yet been time for the industries to adjust themselves to the new tariff; that now a new bill is introduced to revive agitation. He thought that the industries wanted peace. That prices are constantly declining and are now as low as prudent to go. He did not believe so much in foreign as in domestic markets, and legislation should promote this domestic exchange. He urged that it was necessary to maintain the present conditions of labor at home, and not invite foreign labor. Too little was said about inviting capital. The manufacturers of the United States were compelled to keep pace with the industries of other parts of the world, and if the legislation of this country was designed to bring our conditions down to the basis of capital and labor there, it would be a sad day for all. He gave some idea of the extent of the value of industries to railroad development, which is of benefit to all, by stating that the Carnegie Works alone paid more in freights than was paid in moving the whole cotton crop of the South. These great industries, therefore, cheapen freights for the farmers by justifying the extension of railroad facilities.

He showed the competition of Spanish ores, which led to several questions from Mr. Hewitt, of the committee, designed to elicit information favorable to free iron ore. Mr. Herbert, of the committee, also asked a number of questions, evidently designed for information as to the adaptability of Alabama ores to the manufacture of steel by the Thomas-Gilchrist and pneumatic processes. This led to a long discussion about the steel patents and royalties owned by the Bessemer Steel Company, Limited. Mr. Herbert, of the committee, could not understand why, if the ores were suitable, the manufacture of steel did not go to Alabama. Mr. Wharton showed that the South had no capital, and gave other reasons why Northern capital would rather import ores to mix and pay the duties than run the risk of large investments in the South in the present condition of public sentiment on economic questions, the unsettled state of society and sectional prejudices. Mr. Wharton intimated that capital would never go to the South until some very radical changes took place in the views, habits and customs of a large share of the people who are in a position to appreciate their interests better. Returning to the subject of iron ore, Judge Kelley and Mr. Hewitt indulged in an exchange of shots, the former objecting to categorical answers being demanded on hypothetical questions. The remarks of Mr. Wharton, with the frequent interrogatories put to him, were at times quite spirited.

Mr. George H. Ely, of Cleveland, Ohio, for the Eastern and Western iron-ore associations, gave an interesting review of the iron-ore industry, and showed the injurious effect the removal of the duty of 75 cents a ton would have on a large class of the people. He said that the Continent was underlaid with iron ore of every variety. He gave an interesting history of the origin and growth of the iron-ore industries on Lake Superior, stating that \$81,000,000 of capital were invested in mining and transporting ore. It was, therefore, a matter of justice and honor not to sacrifice this vast enterprise by bringing in the cheap ores produced by the labor of the half-clad Arabs of the coast of Barbary. The manufacturers at Cresson, he said, agreed on 85 cents a ton, and the tariff act of 1883 made it 75 cents.

Mr. Van Dyck, formerly vice-president of the Menominee Mining Company, also gave a forcible review of the prospects of iron ore. He took exception to Mr. Hewitt's position, which led the latter to remark that he had no interest in foreign, but in American mines.

Mr. E. S. Wheeler, secretary of the New Haven Rolling Mill Company and an importer, spoke in favor of free wrought scrap, which would enable his company to manufacture wire rods. In reply to a question respecting importation of wire rods, he said that before the act of 1883 he imported five times as many rods as he manufactured, but since that act ten times as many.

Ex-Attorney General McVeagh then spoke of the importance of allowing the industries to adjust themselves to the new conditions. The present system should be let alone. This is due to capital invested and encouraged during 20 years. This bill would not only affect capital, but labor would suffer still

more. He said that he thought it was without excuse that the great industries of the United States should be made the football of political parties in their struggles for power. Mr. John Roach next read his views on shipbuilding.

After a recess of half an hour, Mr. W. E. Smith, of Plattsburg, N. Y., spoke on the production of iron ores, and gave some interesting points connected with the iron-ore interests of the Eastern States.

Representative A. Herr Smith and Joseph Wharton, in behalf of the production of nickel, reviewed the varying duties on this article and the effect which placing it on the free list would have. The only nickel mines now in operation in the United States, it was shown, were in Lancaster County, Pa., and the chief competition would come from the mines worked by convict labor in the New Caledonia Penal Colony of France in the South Pacific. Under the act of 1870 the duties were 30 cents for nickel and 20 cents per pound for oxide or alloy with copper. The tariff commission recommended 20 cents a pound for nickel in ore or matte and 25 cents a pound on nickel alloy. The act of 1883 levied a general duty of 15 cents a pound. Mr. Smith said he would like the author of the bill to inform him what had happened in this brief time to convince him that it should be placed on the free list.

J. Wyman Jones, of St. Joseph, Mo., spoke on the lead-mining industry. He traced its development in their own mines from 50 to 800 tons a month, and reviewed the general prosperity and comfort of the laborers, who received from \$1.30 to \$2.75 a day.

Messrs. E. P. Williams, of New York, and John Jarrett, of Pittsburgh, made a very earnest plea in favor of an increased duty on tin plates. Some representative workmen also added their testimony against any reduction of duties.

These arguments consumed the entire day. In addition to the general protest, additional papers were submitted to the Committee on Ways and Means, one of which was a memorial and protest by the Eastern Pig Iron Association, representing the manufacturers of pig iron in the States east of the Allegheny Mountains, and another was a statement by Mr. J. B. Moorhead, of Conshohocken, Pa., showing the actual loss in the manufacture of pig iron entailed upon the owners of average furnaces in the Lehigh and Schuylkill Valleys with pig iron selling at present rates.

ADDITIONAL STEEL VESSELS RECOMMENDED.

February 12.—A bill for the construction of seven additional steel vessels was reported from the Senate Committee on Naval Affairs to-day by Mr. Hale. The bill provides for the construction of one cruiser of 4500 tons displacement, the size of the Chicago; one cruiser of 3000 tons displacement, the size of the Boston and Atlanta; one dispatch boat, 1500 tons; two heavily armed gunboats, 1500 tons each, and two light gunboats of 750 tons each. It is estimated that \$2,103,127 will be required, in addition to the \$1,303,000 already appropriated, to complete the four cruisers now being built. An appropriation of \$3,996,654.62 is needed for the completion of the monitors, including the modern guns. Admiral Porter says that the country wants not less than 10 ships of the Chicago size, 40 to 50 ships of the size of the Boston and Atlanta, 15 or 20 torpedo boats and 15 or 20 gunboats immediately. He says that within four years' time, under the rule adopted of not repairing vessels—the cost of which exceeds 20 per cent. of the original cost of the ships—almost every vessel now in the navy will go on the retired list.

THE DUTY ON CHAINS OF SPECIAL LENGTHS.

The synopsis of decisions rendered by the Treasury Department in customs cases for the week ending February 9 contains the following affecting iron: Chains made to special lengths, and claimed not to be adapted for general use, but for special purposes, and to be therefore dutiable at 45 per cent. ad valorem, as manufactures of iron not otherwise provided for. Held, that they were liable to duty at the rate of 2½ cents per pound under Paragraph 171 for chains of all kinds of the sizes therein specified. (Letter to Collector of Customs at Chicago, Ill.)

A FEATURE OF THE MEXICAN TREATY.

February 15.—One of the objectionable features of the Mexican treaty, pending before the Senate, was disclosed this morning, when Senator Farley, of California, presented a memorial from the Trinidad and San Jose Silver Mining Company of Mexico, who have their headquarters at San Francisco. This memorial calls the attention of the Senate to the fact that the proposed treaty legalizes claims of Mexican citizens, decided adversely by the United States and Mexican Joint Claims Commission, but forever bars claims decided against American citizens by the same tribunal.

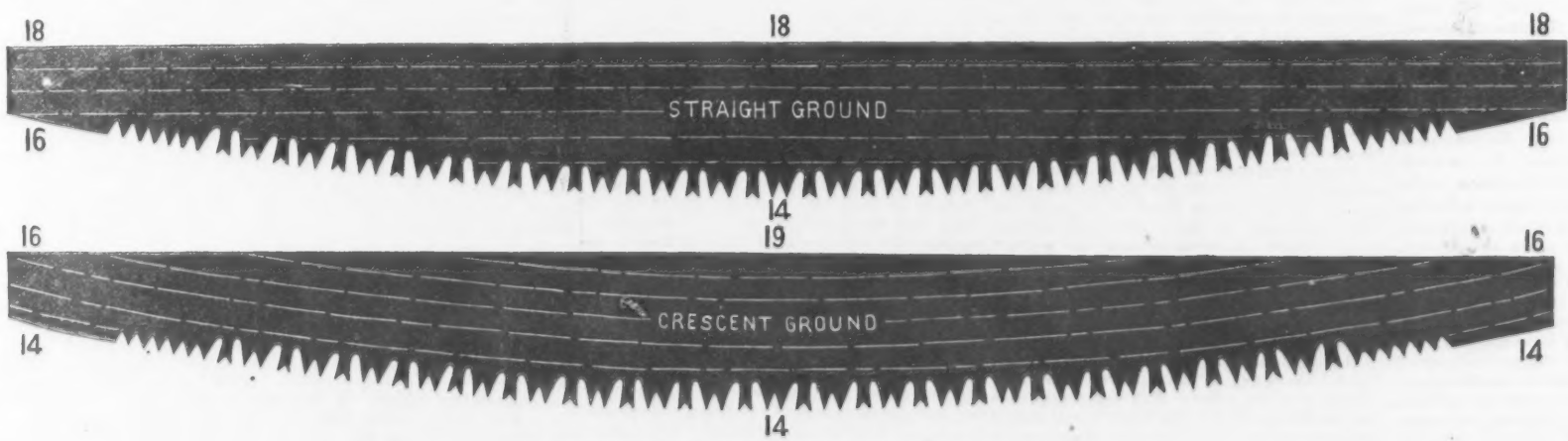
THE TREASURY EXPERTS AND THE MORRISON BILL.

February 17.—The Treasury experts have completed their first essay on the Morrison bill. They have not been able in a great many cases to show what percentage of reduction should be applied to various articles. Taking some of the items, it would appear that the Morrison bill would increase instead of diminishing the rate of duties now paid. For example, in the item of wire, the present rate on iron or steel wire, smaller than No. 5 and not smaller than No. 10 wire gauge, is 1½ cents a pound by the Morrison bill, according to the figures of the Treasury experts. While the rates on iron wire of the same size will be reduced to 1½ cents a pound, the rate on steel wire will be increased from 1½ cents to 2 cents a pound. So on wire smaller than No. 10 and not smaller than No. 16, wire gauge, it will be increased in the cases of both iron and steel wire from 2 cents a pound to 2½ cents. On wire smaller than the above it is rather difficult to ascertain from the figures what the reduction will be, but apparently that wire will stand where it is. Taking the whole wire schedule together, the only reduction will be .4 of a cent a pound on iron wire between No. 5 and No. 10 wire gauge, and an increase on all other wire. In a few cases the experts seem to have been unable to reach any conclusion whatever, and in sheer despair they put the words "no data" in the column headed by the Morrison bill. Among the items thus distinguished is card clothing.



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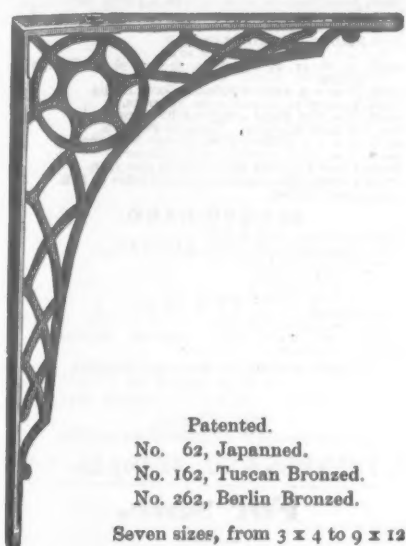
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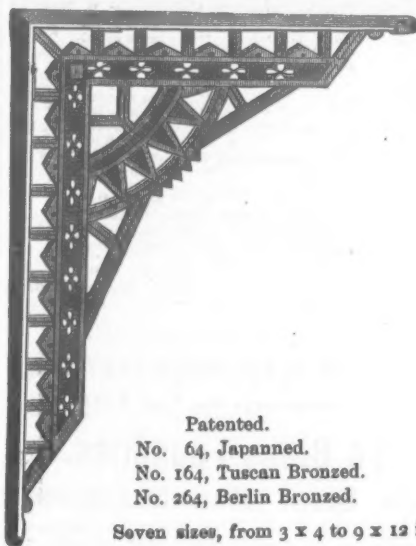
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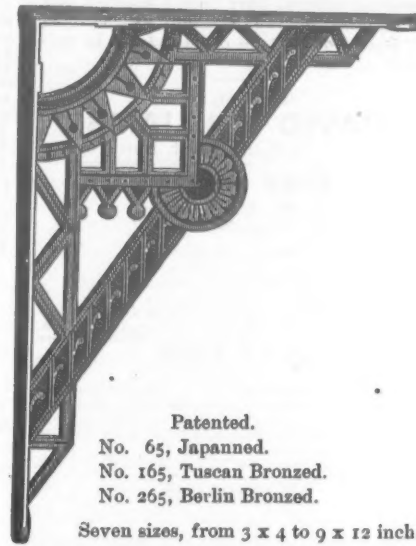
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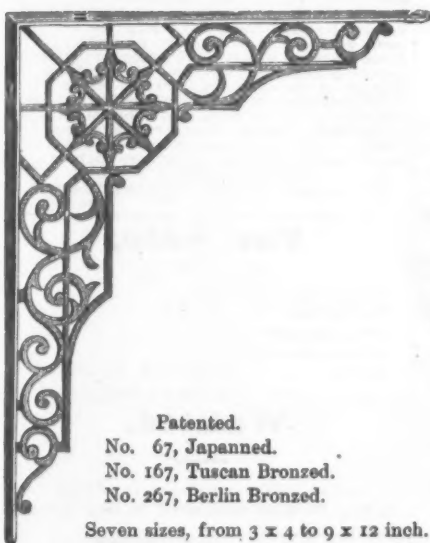
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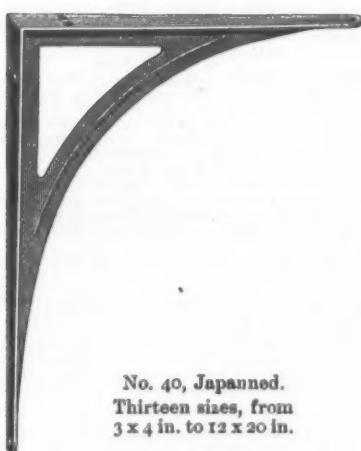
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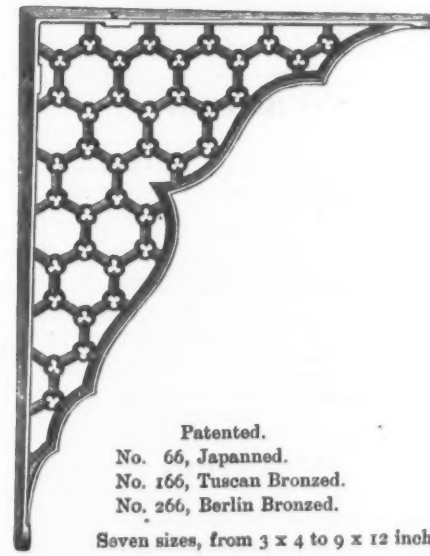
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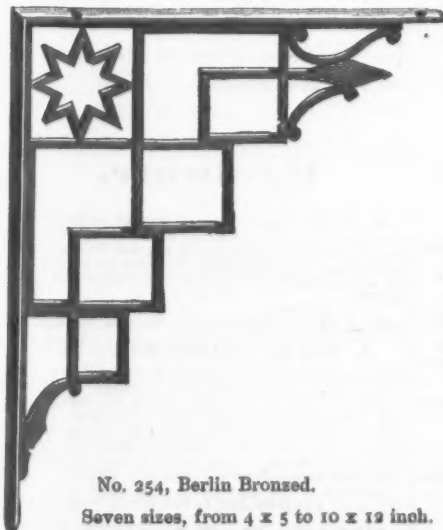


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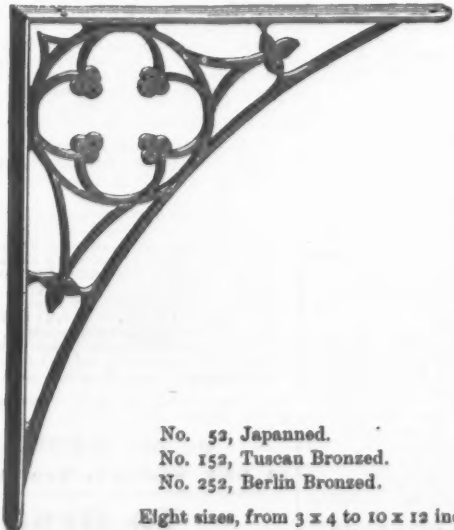


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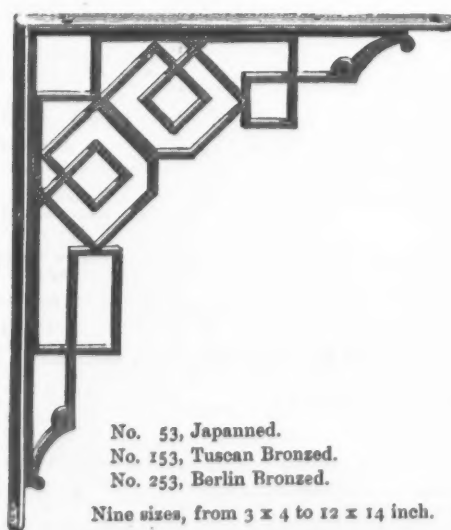


No. 254, Berlin Bronzed.
Seven sizes, from 4 x 5 to 10 x 12 inch.



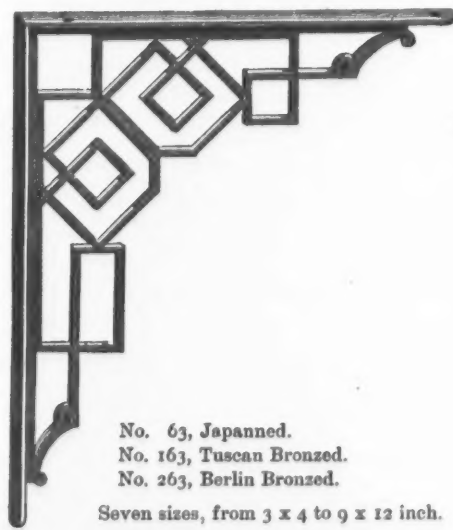
No. 52, Japanned.
No. 152, Tuscan Bronzed.
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No. 153, Tuscan Bronzed.
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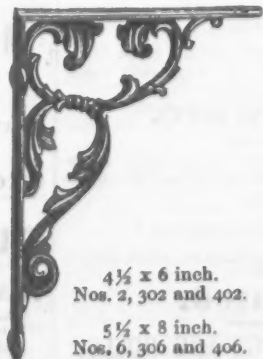


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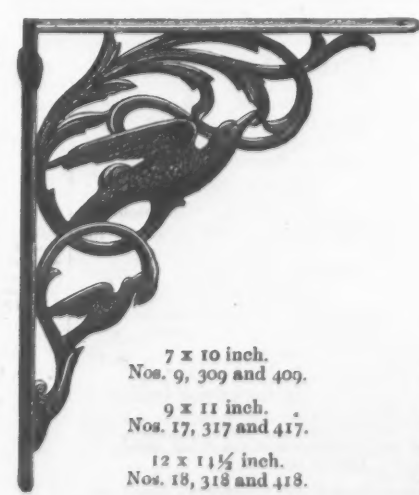
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7 x 10 inch.
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"FOUNDRY FOREMAN-26"

Office of The Iron Age, 83 Reade St., New York.

WANTED—A situation as manager or traveling salesman in Hardware, Metals, House Furnishings, Cutlery or Lamp Goods, by an energetic, reliable man, with 12 years' experience, who has acted as manager for large wholesale house in Canada. Best of references as to ability, &c. Would prefer an engagement with manufacturer to canvass wholesale trade in the United States.

Address

"BOX 585,"

St. Thomas, Ont., Canada.

Trade Report.

BRITISH IRON AND METAL MARKETS.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, Feb. 20, 1884.

Scotch Pig.—The market is a little weaker. We quote makers' brands as follows:

Coltness, alongside, Glasgow.....58/6
Langloan, " " " " " ".....58/6
Garscherrie, " " " " " ".....54/6
Sunmerlee, " " " " " ".....53/6
Cambro, " " " " " ".....53/6
Glenarmock, " " " " " ".....52/6
Eclintock, " " " " " ".....47/6
Dunmellington, " " " " " ".....47/6
Shotts, " " " " " ".....47/6
Lighterage from Ardrossan to Glasgow is 1/3d.

Cleveland Pig.—The market is irregular. We quote as follows, f.o.b. shipping ports:

Middlesboro' No. 1 Foundry.....41/6
" No. 2 " " " " " ".....40/6
" No. 3 " " " " " ".....37/6 @ 37/8

Bessemer Pig.—Is irregular. W. C. Hematites are quoted 47/6 @ 48/6 for mixed shipping ports.

Manufactured Iron.—Continues irregular. We quote at works:

Staff. Ord. Marked Bars.....7 10 0 @ 8 5 0
" Medium " " " " " ".....6 5 0 @ 6 15 0
" Common " " " " " ".....6 0 0 @ 6 5 0

Hoops, 20 W. G. and over.

" Common Best.....7 0 0 @ 7 5 0
" Medium " " " " " ".....6 5 0 @ 6 15 0
" Common " " " " " ".....6 0 0 @ 6 5 0

Sheets, 20 W. G. and under.

" Ordinary Best.....8 15 0 @ 9 5 0
" Common " " " " " ".....8 0 0 @ 8 5 0
Welsh Bars.....5 2 6 @ 5 5 0

Steel Rails.—The market is quiet and unchanged. We quote: Ordinary Sections, 4 1/2 @ £5, f.o.b. shipping ports.

Old Rails.—Are a little firmer. We quote Old D. H.'s, £3. 7/6 @ £3. 10/6, c.i.f. New York.

Scrap.—The market is a little firmer. We are reported sales of 1000 tons for prompt delivery San Francisco. We quote Heavy Wrought, £2. 10/ @ £2. 12/6, c.i.f. New York; Bessemer Crop Ends, run of the mill, are quoted 50/ @ 51/6, f.o.b. shipping ports.

Copper.—The market is irregular. Best Selected is quoted 62. 10/ @ 63, and Chili Bars, £55. 10/ @ £56.

Tin.—Is steady. We quote Straits Ingots, spot, £82. 10/ @ £83. 5/6, and futures £83. 5/ @ £83. 15/6.

Tin Plates.—Are irregular. We quote:

Tin Plates, 10 x 14, 1st qual. Charcoal.....19/6 @ 21/6
" " " " " ".....18/6 @ 19/6
" " " " " ".....17/6 @ 18/6
" " " " " ".....15/6 @ 16/6

Spelter.—The market is quiet. We quote Ordinary, at shipping ports, £14. 10/ @ £14. 15/6.

Lead.—Is a little weaker. We quote Common English Pig, £11. 15/ @ £12.

Freights.—Steam from Glasgow to New York, 4/6 @ 5/; Liverpool to New York, 4/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

TRADE AND FINANCE.

Office of The Iron Age.

WEDNESDAY EVENING, Feb. 20, 1884.

Both in trade and finance the week has been spiritless, and events are without special significance. In no small degree the lack of animation is due to execrable weather, supplemented by disastrous floods in the West. Happily, the waters are fast receding, and already advices from Pittsburgh and other important manufacturing points are to the effect that there will be an immediate resumption of operations in the iron mills, glass factories and coal mines. Speculation on all sides has received a decided quietus, of which there are indications in the lessened volume of business and lower prices. The suspension of the well-known stock-jobbing firm of McGinnis Bros. & Fearing, who were deficient \$97,000 in their indebtedness to the Oregon and Transcontinental Company, also of John L. Savage on the Petroleum Exchange, were consequences of the changed condition of the market. On Monday, for the first time in a year, the price of crude-oil certificates declined to below \$1 3/4 barrel. Bradstreet's reports a smaller number of failures last week than the preceding week, while R. G. Dun & Co. report an increase, particularly in the West and on the Pacific Coast, also in Canada. Wheat, corn and provisions are all lower and irregular, attributable to a relaxation of interest on the part of prominent operators, and to realizing generally. In May pork and lard there was a heavy break. On the other hand, trade in flour has improved, but the gain is slow, and the price of cotton has advanced. In regard to the export demand, there is no change for the better. Despite these rather somber features, the clearing-house returns for the week from 24 leading cities show a decrease of nearly 6% in the volume of business, compared with the corresponding week last year, while in New York there was an increase of 1.5%.

The market for sterling exchange was stronger to-day, and the posted rates were advanced to \$4.87 @ \$4.90 1/2, and actual rates for demand bills are 1/4 above the gold exporting point; but there is less apprehension concerning the effect of specie shipments. Specie would undoubtedly have gone out to-day, had there been a first-class steamer on the eve of departure. We understand that the Clearing-House authorities

have under advisement a proposition from the Assistant Treasurer of the United States with reference to the Government paying its balances in silver, in a certain contingency. Existing rules, which prohibit the receipt of silver dollars on deposit except under special contract, cannot be changed without 30 days' notice, which has not yet been given. Thus the question respecting a change of the standard of value is directly presented, and, in consideration of the momentous interests at stake, it may be better to invite immediate action rather than delay until the situation is aggravated by continued silver accumulations.

On the Stock Exchange, during the week under review, the market has generally ruled strong, having in a measure recovered from the previous decline. The movement in Rock Island was stimulated by the supposed movements of Vanderbilt to obtain Central. On Saturday Manhattan Railway and Pullman Palace Car were special features, the former advancing 3%, while the latter declined heavily on a report that new stock would be issued. Delaware, Lackawanna & Western also advanced on the announcement of 14% award by arbitrators in the Trunk Line pool. On Monday the suspension of McGinnis Bros. & Fearing depressed the market. On Tuesday the market closed strong, which was continued to-day, but a slight reaction ensued in consequence of a further advance in sterling exchange; prices of some of the leading stocks closing as follows: Jersey Central, 89 1/4; Western Union, 76 1/2; Reading, 58 1/2; Canadian Pacific, 56 1/4; Northwestern, 121 1/4, and Union Pacific, 83 1/4.

United States bonds were firm, as quoted below:

	Bid.	Asked.
U. S. 4 1/2, 1891, registered.....	113 1/2	114 1/2
U. S. 4 1/2, 1891, coupon.....	114 1/2	115 1/2
U. S. 4, 1897, registered.....	114 1/2	115 1/2
U. S. 4, 1897, coupon.....	115 1/2	116 1/2
U. S. 3 1/2, 1890, registered.....	109 1/2	110 1/2
U. S. Currency 68, 1890.....	121	—
U. S. Currency 68, 1897.....	121	—
U. S. Currency 68, 1897.....	121	—
U. S. Currency 68, 1897.....	121	—
U. S. Currency 68, 1897.....	121	—

The bank return for the week shows a decrease of \$1,083,600 in surplus reserve, which now stands at \$20,010,800, against \$3,674,825 at the same time last year, and \$1,072,225 at the corresponding date in 1881. The loans show a gain this week of \$3,975,100, from which it may be inferred that money of late is finding more profitable employment. The present expansion for the moment receives little attention, owing to the extraordinary increase of reserve, but will excite more special remark in the spring, when the wants of the commercial community are on a larger scale, and when the annual settlements call for larger amounts in the interior.

The imports of merchandise at this port during the past week were of good proportions, the total being \$8,630,982. While the receipts of general merchandise were rather light, there was an unusually heavy movement of dry goods, the imports amounting to \$3,735,216. Since January 1 the imports aggregate \$58,705,375, compared with \$63,798,486 for the corresponding period of 1883. The importations of specie for the week amounted to \$99,782, mostly in silver, making a total of \$822,000 since January 1, and the exports of specie amounted to \$278,504, making a total of \$2,272,777 since January 1, against \$1,816,000 for the same time in 1883. The exports of domestic produce from this port during the past week were below the usual average, their value being \$6,394,219, against \$6,963,600 for the same week last year. Since January 1 the exports aggregate \$43,240,885, compared with \$49,168,623 for the corresponding period of 1883.

GENERAL HARDWARE.

The general features of the trade have not materially changed, business continuing in volume up to the average, but at narrow margins. In many lines of goods a fairly satisfactory trade is doing, and jobbers and manufacturers speak cheerfully of the condition of business and prospects for the season. Collections are good and prices steady.

Our readers will be interested in the movement which has been made among the Hardware trade in this city, through the Hardware Board of Trade, for the relief of the sufferers by the

OHIO FLOODS.

The fund thus raised, amounting to \$1185, all of which is paid in, is being distributed in such localities as are in need of help, through the "Advisory Committee" which was appointed by Mayor Edson, of this city, on the 14th inst.

If others, merchants or manufacturers, desire to add their contributions to this fund, which not only expresses sympathy with the sufferers, but renders them greatly needed assistance in the pressure of a great calamity, their remittances may be sent to James H. Goldey, actuary of the Hardware Board of Trade, 4 and 6 Warren street, New York. We should be glad to be able to report in our next issue a substantial addition to this already creditable amount. The subscriptions received up to to-day are as follows:

Eaton, Cole & Burnham Co.....	\$100.00
Russell & Erwin Mfg Co.....	100.00
David Williams.....	100.00
Sargent & Co.....	100.00
Wallace & Son.....	50.00
Wiebusch & Hilger Mfg Co.....	50.00
Hermann Boker & Co.....	50.00
J. L. Mott Iron Works.....	50.00
Schoeninger, Daly & Gales.....	50.00
Bruce & Cook.....	50.00
McNab & Harlan Mfg Co.....	50.00
Prime & Atwood Mfg Co.....	50.00
Waterbury Brass Co.....	50.00

Louderback, Gilbert & Co.....	50.00
Stanley Rule and Level Co.....	50.00
John P. Moore's Sons.....	50.00
Borden & Lovell.....	50.00
Maltby, Curtis & Co.....	50.00
Underhill, China & Co.....	50.00
D. H. Wilson & Co.....	50.00
Henry Huber & Co.....	50.00
Tennis & Wilson.....	50.00
Tuttle & Bailey Mfg Co.....	50.00
Total.....	\$1,185.00

RALPH W. BOOTH.

The announcement of the death of Ralph W. Booth on the 14th inst., at his home in this city, recalled the career of one who was for many years prominent in the Hardware trade as the head of one of the largest jobbing houses of the West. Mr. Booth was born in New Britain, Conn., in 1818, and when 16 years of age he went to Hartford, where he became a clerk in a large Hardware house. Having attained a thorough knowledge of the business, after spending some time in this city he went, in 1844, to Cincinnati, where he was first in the employ of Clark & Grosbeck, for whom he came to this market as buyer, soon, however, being taken into the firm, which then became Clark & Booth. After a short time Mr. Booth became the head of the concern, which then, and for many years, was known as R. W. Booth & Co. Mr. Booth is thus entitled to the distinction of being one of the pioneer Hardware men of the West, his name, with a few others, occurring to those whose business recollections go back 30 or 40 years, as leaders in the Western jobbing trade. The business prominence of Cincinnati during the years of Mr. Booth's activity there justified his sagacity in choosing that city as the field of his efforts, and his foresight is shown in the fact, which is mentioned to us, that the brick building he erected on the corner of Walnut and Pearl streets was the first five-story building in Cincinnati. But we need not recall the successful career of his firm until, in 1873, he suffered reverses and retired from the business. During that period it was that he was chosen president of the Western Hardware Association—a fact which illustrates the position he held before the trade and the confidence with which he was regarded. In 1875 he accepted the position of treasurer of the Consolidated Fruit Jar Company, in this city, at 49 Warren street, and in 1877 he was elected its president, a position which he filled until a year ago, when his failing health compelled his retirement from active life. That the personal qualities and business ability which characterized Mr. Booth during the many years of his connection with the Hardware trade, and commanded the success he attained and the high esteem of those who knew him intimately, were manifested also in his later business career, is shown in the following minute, which was adopted on the 19th inst. by the Board of Trustees of the Consolidated Fruit Jar Company:

Whereas, We have learned with sincere sorrow that his lingering illness has terminated in the decease of Ralph W. Booth, our late president.

Resolved, That by the death of Ralph W. Booth, we have lost a highly-valued friend and associate in this Board of Trustees.

That during his administration of the affairs of this company, as trustee, treasurer and president, extending over the trying years of 1875 to 1883, his mature judgment, financial ability, tireless application to duty and unswerving integrity were prominent among the many traits of his character, and largely contributed to the prosperity of this company.

That the management of the company's factories required in its president the rare combinations of firm justice, kind courtesy and manly consideration, as essential to a successful rule over men, and our late president has won from the numerous employees their wide respect, kindly regards and grateful memories of him.

We tender our heartfelt sympathies to the family of Ralph W. Booth, and unite with them in the sorrows that cause our mourning.

That this memento be suitably engrossed and bound, and, when signed by the officers of the company, presented to the family of the deceased.

GEORGE V. POMEROY.

We are called upon also to record the death during the past week of George V. Pomeroy, who, while for a number of years out of the Hardware business in this city, and hence not widely known by the younger members of the trade, was at one time prominent as a merchant. He is deserving of special mention in these columns, apart from his personal qualities and long business career, from the fact that he was, if not the first, certainly among the first, of the domestic Hardware commission merchants in this city.

Mr. Pomeroy was born in Wallingford, Conn., in April, 1807, and was consequently nearly 77 years of age at his death. In 1828 he went into the commission Hardware business at 5 Cedar street, in this city, under the firm name of G. V. Pomeroy & Co., soon after moving to 81 Pine street. About the year 1830 the firm was G. V. Pomeroy & Wells, successively on Pearl and Water streets, when the copartnership became Atwater & Pomeroy, who to their line of domestic Hardware added Stoves, doing a successful business, and large for those days. After this Mr

Special Notices.

RECENT BOOKS.

Turnbull.—Treatise on the Compound Engine.—By John Turnbull, Jr. Revised, with additions, by Prof. S. W. Robinson, C. E.; illustrated with diagrams and tables, 192 pages, 18mo, boards. . . \$0.50

This little volume is divided into two parts. The first part treats only of the Woolf compound engine, in which there is no receiver and where the high and low pressure cylinders are in immediate steam connection. The second part has been added to make the treatment more general and complete, and to include the intermediate receiver, clearance and cushion. Both the analytical and graphical methods have been employed, and it is claimed that by the diagrams presented any engine of the type discussed can be correctly laid out.

FOR SALE BY

DAVID WILLIAMS,
83 Reade Street, New York.

For Sale.

One 8-in. x 10-in. Vertical Engine.
One 8-in. x 12-in. Horizontal " "
One 12-in. x 20-in. " "
One 10-in. x 6-ft. Vertical Boiler.
One 16-in. x 7-ft. " "
Two 14-in. x 16-ft. Horizontal Tubular Boilers.
One 6-in. x 16-ft. " "

CHARLES W. ERVINE & CO.,
420 Ireland Street, Philadelphia, Pa.

WANTED.

A position as Salesman, by one who has had several years' experience in the Hardware Business. Would be pleased to communicate with any one desiring a Salesman, either in New York City or elsewhere. Address "R. R." Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

A SECOND HAND GATES NO. 3 CRUSHER, warranted in good condition. State lowest price and where it may be seen. Address "CRUSHER," Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

A Salesman in an Iron House. One who is capable of handling Pig Iron and has trade in Pennsylvania and New York. Address "B. & R.," Office of *The Iron Age*, 220 S. 4th St., Philadelphia.

Wanted—Partner,

IN THE GENERAL MACHINERY BUSINESS. To a man with capital a fine opportunity is offered in a house doing a good business and of established reputation. For particulars, address "MACHINERY," Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

A man to handle Engines and Boilers in New York City for a Philadelphia Manufacturer. Address "BOILERS," Lock Box 2161, Philadelphia P. O.

Wanted.

A 20 or 25 Horse-Power Portable Engine and Boiler, warranted in good working condition. State lowest price, make, when built, how long in use, for what purpose used, and where it may be seen. Address "ENGINES," Office of *The Iron Age*, 83 Reade St., New York.

HOOK-KEEPER.

A good Penman and a rapid and accurate Accountant wanted in the Hardware Business. Ten years' experience. Address "BOOKKEEPER," Office of *The Iron Age*, 83 Reade St., New York.

HARDWARE.

For Sale.—A clean stock of Hardware, in one of the most thriving cities in New York, and a good paying business; stock of \$12,000, but can reduce to suit purchaser. Reasons for selling out, not connected with the business. Address B. C., Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

To communicate with some Eastern parties who are desirous of establishing an agency for their goods in Chicago, by a gentleman of business experience. Hardware preferred. Address "HARDWARE," 481 Wabash Ave., Chicago, Ill.

Estimates Furnished

and contracts taken for power shears, power punches, steam hammers, steam riveters, boiler plate planers, and heavy punches made at reasonable figures. Work guaranteed. B. GRAVES LOUDEN, 223 St. and Washington Ave., Philadelphia.

WILL OFFER below market rates the following:
NAILS.
LOCKS.
SCREWS.
AND STRAP AND T HINGES.

Wanted.

A. W. WHEELER,
141 Lake Street, Chicago, Ill.

SITUATION WANTED.—By Hardware Salesman of 10 years' experience and acquaintance with jobbing trade throughout the West, South and Northwest. Best of references. "G. E. F.," Office of *The Iron Age*, 83 Reade St., New York.

FOR SALE.—To party with \$20,000 to \$25,000 cash capital, a good paying Hardware Business in Colorado. Good reason given for selling. Address "BOX 2634," Denver, Col.

Wanted.

From 2 to 4 miles 15 lb. Light T Rail, second hand. Address R. BALLAUF & CO., Jefferson, Texas.

A YOUNG MAN who has a thorough knowledge of the German language, capable of taking charge of a set of books, and has had 5 years' experience as selling Agent for Iron Manufactory firm, desires a position in the Spring in a Western Hardware firm. Best of references given. Address "A.," Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

For Sale or Exchange.

A party owning a complete Plate and Sheet Mill as per following list, will sell the whole or part of it for cash and long-time payments, or will exchange for Real Estate desirably located in any of the following cities: New York, Chicago, St. Louis or St. Paul.

1 Train of Lath's 24-in. 3-high Rolls.
1 Train of 2-high 22-in. Plate and Sheet Rolls and Duplicate Rolls.
1 Compound 18-in. Muck Train and Duplicate Rolls.
1 Large Engine, 32 x 42, horizontal, 20-ton fly, doubly-braced, wheel 12 in. face.
1 Large Rotary Squeezer for 150-lb. Ball.
1 Large Roll Turning Lathe for Turning-up Rolls.
1 Large Pump.
2 Large Cranes for Handling Housings and Rolls.
1 Plate Shear to shear as high as 3 1/2-in. Plates.
1 Sheet Shear.
1 Scrap Shear.
1 Scrap Shear and Engine.
1 Large Sturtevant Blower and Pipe.
1 Blacksmith's Drill.
Furnace Plates for 3 furnaces, including Annealing and Fair Furnace.
Furnace Plates for 4 Charcoal Fires, including Valves, &c.
1 Battery of 3 extra flange Fire-box Boilers; size, 28 ft. by 48 in.; 2-blue, 16 in., to operate together or separate; with all connections.
1 Large Boiler, fire-box-metal, 28 ft. by 42 in., or 44 in.
1 Small Boiler, 22 ft. by 42 in.
1 Track Scale, Wagon Scale, Mill Scales, Tools, Tramways, Buggies, Patterns, &c.

H. W. WHITLOCK,
130 Dearborn St., Chicago.

To Rent or For Sale.

One Three-story Brick Building, 30 x 50 feet. Heated by steam with 30 horse-power Engine. Desirably located at Meriden, Conn., for manufacturing purposes. Apply to THE HALL RAILWAY SIGNAL CO., Meriden, Conn.

For Sale.

Half interest in first-class Foundry and Machine Shop, doing good business and owning valuable patents. Other business cause of selling. Address E. H. HASTINGS, Bath, N. Y., or, 5 Bowling Green, New York City.

For Sale.

A 1-ton Helve Hammer, built by Merchant & Morgan, Alliance, Ohio. Drawings of the same furnished on application to NORWAY STEEL & IRON CO., South Boston, Mass.

SAMUEL, SONS & BENJAMIN,

No. 1 RUMFORD PLACE, LIVERPOOL, ENGLAND,

are open to undertake agencies, and thoroughly introduce in the British and Continental markets American Hardware and specialties of merit.

Correspondence solicited through their Canadian house,

M. & L. SAMUEL, BENJAMIN & CO., Hardware, Metals, &c., Toronto, Ont.

Treasurer Wanted,

by a well-established manufacturing company in Massachusetts, well located, with ample water-power, New Buildings, Tools and Machinery, capable of producing \$100,000 per annum. Sales, 1883, \$40,000. Special inducements and absolute control offered to the right man. Business: Hardware and House-Furnishing Goods, with ample facilities for contract work.

Ample Room and Power for consolidation with another concern making similar goods, or in the lines named. Our object is to divide a rather large expense account and double sales. "JAMES," Office of *The Iron Age*, 83 Reade Street, New York.

Valuable Business Opportunity.

A firm engaged in the manufacture and sale of standard machines in universal use and protected by numerous letters patent desire to sell the business, patent, good-will and all plant pertaining thereto. The business has been established since 1846, and the reputation of the goods is world-wide. Satisfactory reasons for selling, and a full statement of assets, business profits, &c., will be furnished to responsible parties, but to principals only. Address A. B., Office of *The Iron Age*, 220 S. 4th St., Philadelphia.

Wanted.

By an Eastern Tin Plate, Sheet Iron and Metal House, a representative residing West, who will sell their goods on commission, in connection with Stoves and Stamped Ware, in the States of Iowa, Nebraska, Kansas and Missouri. Address "TIN PLATES," Office of *The Iron Age*, 83 Reade Street, New York.

SALESMAN WANTED

in the New York office of a manufacturing company; a first-class man of good address and experience, as inside and outside salesman. One familiar with the Machinery and Hardware trades preferred. Address, stating age, experience, references and compensation expected, "MACHINERY," Box 34, Office of *The Iron Age*, 83 Reade St., New York.

A SUCCESSFUL Wholesale and Retail Hardware House wants to increase its capital and would correspond with a capable man of means desiring an active business. This is an opportunity for one in search of health or profit. The climate is unexcelled, and the city the commercial center of two Territories. References given and required. Address ALBUQUERQUE HARDWARE CO., Albuquerque, New Mexico.

WANTED.—A gentleman with knowledge of mechanics, familiar with machinery, and with executive ability, to take charge of the office of a manufacturing company in Boston. Address, with reference, CLARKE, P. O. Box 572, New York City.

Special Notices.

New and Second-hand

MACHINERY.

One Engine Lathe, 20 ft. bed, 42 in. swing. New.
One " " 18 " " 36 " " " " " "
One " " 16 " " 30 " " " " " "
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mission business in this city, the firm being G. V. Pomeroy & Sons, in which he continued until the death of his sons, a few years ago.

There are not many who recall Mr. Pomeroy's early career, but appreciative tributes are paid to his ability and worth, and the qualities which endeared him to his friends. As a pioneer in the sale on commission of American Hardware, his career is connected with a branch of the Hardware business which has grown to extraordinary proportions, and in which he is entitled to an honorable place. His brother, Grove Pomeroy, No. 1 Platt street, who was for many years associated with him in his various enterprises, survives him.

SCREWS.

At present there is in Screws only a limited business, most of the manufacturers reporting that they are well occupied with orders, and unwilling to make concessions from their quotations. We hear of no new circulars, the situation remaining substantially as it was a week ago. We continue to quote Screws at from discount 70 per cent. to discount 75 per cent., at both of which figures sales are made.

The American Screw Company, referring to the views of a leading house, which we published in our review of the Screw market last week, take exception to the attempt, as they interpret it, to throw the blame of the present situation upon them, and they authorize us to say that they did not determine not to enter another combination until they had proposed an arbitration of all matters in controversy, being joined in this proposition by all the members except one of the committee appointed by the association to recommend a plan of action. They add that they were careful not to demand anything, and favored an appeal to arbitration as the most satisfactory solution of the difficulties in question.

The following is the full text of the circular of the Union Steel Screw Company, the prices quoted in which we gave last week: CLEVELAND, Ohio, February 11, 1884. GENTLEMEN: From this date, until further advice, we quote the following discounts for Wood Screws of our manufacture, which are first quality only:

Flat Head Steel.....75 %
Round Head Steel.....65 %
Flat Head Brass.....70 %
Round Head Brass.....60 %

Terms cash. No prices guaranteed. All orders subject to our ruling prices at date of shipment. Orders for unusual proportions of any sizes will be executed at special prices, as may be agreed. Soliciting your favors, we are, yours respectfully,
UNION STEEL SCREW COMPANY.

CORDAGE.

There has been another reduction in the price of Manila Rope, as shown in the following revised list, which is issued under date February 18th. It is subject to the usual discount to the trade of 1 cent per pound:

Manila Rope.		Cts. per lb.
1 1/4 inch cir. and upward.....	14 1/2	
12 thread, or 3/4 inch diameter.....	15 1/2	
6 & 9 thread, or 1/2 and 5/8 inch diameter.....	15 1/2	
Hay Rope, 2, 3, 4 or 5 thread.....	14 1/2	
Bolt and Point Rope.....	16	
Tarred Rope and Lath Yarn.....	14	
Stave, Leather and Hop Twine.....	15	
Steel Rope.		
1 1/4 inch cir. and upward.....	9 1/2	
12 thread, or 3/4 inch diameter.....	10	
6 & 9 thread, or 1/2 and 5/8 inch diameter.....	10 1/2	
Hay Rope, 2, 3, 4 or 5 thread.....	9 1/2	
Tarred Rope and Lath Yarn.....	9 1/2	
Russia Hemp.		
White Rope.....	17	
Tarred Rope and Ratline.....	11	
Spun Yarn.....	10 1/2	
Bolt Rope.....	15	
Marline, Houseline, Rounding and Hambro-line.....	15	
Packing.....	16	
American Hemp.		
White Rope.....	18	
Tarred Rope and Ratline.....	12 1/2	
Spun Yarn.....	12 1/2	
Bolt Rope.....	12 1/2	
Lath Yarn.....	12 1/2	
Packing.....	17	
Marline, Houseline, Rounding and Hambro-line.....	16	
Sash and Bell Cord.....	25 to 35	
Italian Hemp.		
Packing.....	20	
Tarred Rope.....	16	
Jute.		
Rope and Packing.....	8	
Oakum.		
Best Oakum.....	9	
U. S. Navy.....	8	
Navy.....	6 1/2	

On 100 bales and over.....1/4 ct. per lb.

BARB WIRE.

The situation continues practically unchanged. A fair amount of orders is being booked, but business is not as active as manufacturers would like to see it. Nevertheless, there is a better feeling all round, and prospects are favorable for a much greater volume of trade as the season opens. A movement is on foot among manufacturers to establish an understanding by which fixed rates can be maintained in certain localities. If the movement in favor of the organization of a general syndicate results in complete success, however, there will be no end of this localized combination; but if the syndicate cannot be formed, the minor scheme will probably be put into operation. Prices are still quoted on a basis of 5 1/4 cents per pound at New York for large lots of Four-Point Galvanized Barb Wire, with 1/4 @ 1/2 cent additional for small quantities.

NAILS.

The demand continues active, especially for well known and favorite goods. Dealers generally are very well satisfied with the manner in which they are able to make sales. Orders for export are also appearing a little more frequently than has been the case recently. The supply of Nails is apparently sufficient for the demands of the season, notwithstanding the idleness of so many factories. The Fall River Iron Works have shut down, pending a readjustment of wages,

and now all the New England factories are closed. In Eastern Pennsylvania there are also labor difficulties, which may result in the stoppage of several factories. The Western Nail Works have not yet resumed operations in full, as many of them are located in the inundated districts, and will lose two or three weeks in repairing damages. At the monthly meeting of the Atlantic States Nail Association, which was held in this city last Thursday, only routine business was transacted, but there was an interchange of views upon the situation, which elicited the general expression that the condition of trade was satisfactory. No disposition was manifested toward making any change in prices, the belief being pretty well decided that the manufacturers will do very well if they can keep prices steady at about present rates until the building season opens. We quote on the basis of \$2.60 to the trade, with \$2.50 as the rate for large lots, and \$2.65 and upward for small lots.

THE VAN WAGONER & WILLIAMS COMPANY, 82 Beekman street, New York, have issued their price list for the current year for the Spring Hinges, Door Springs, Coat and Hat Hooks, &c., which they manufacture. It describes the new articles which they have put on the market, and the new finish which they have adopted for some of their Gem Hinges and other goods. They make a new style of Empire Spring Hinges for use on screen doors, which are manufactured with loose pin and so made that the pin cannot rise when the tension is on the spring. But special attention is called to the fact that, while the tension can be readily increased or removed, the Hinges are packed ready for use without the necessity of adjustment. These goods are finished in walnut bronze and are sold from the following list, which is subject to a discount of 60 per cent.:

Single Acting.		Japanned.	Japanned, with Nickel Plated Tips and Tubes.
Length of Flanges.	For Doors.	No. pair.	Per pair.
3 1/4 inch.....	3/4 to 1 1/4 inch	63.....	\$0.80, \$1.53, \$1.20
4 ".....	1 " to 1 1/4 "	64.....	1.00, 1.54, 2.00
5 ".....	1 1/4 " to 1 3/4 "	65.....	1.25, 1.53, 2.25
6 ".....	1 3/4 " to 2 "	66.....	1.75, 1.56, 2.75
7 ".....	2 " to 2 1/4 "	67.....	2.25, 1.57, 3.25
8 ".....	2 1/4 " to 2 3/4 "	68.....	3.25, 1.58, 4.50
9 ".....	2 3/4 " to 3 "	69.....	4.50, 1.59, 6.00
10 ".....	3 " to 3 1/4 "	70.....	6.00, 1.57, 7.50

Double Acting.		Japanned.	Japanned, with Nickel Plated Tips and Tubes.
Length of Flanges.	For Doors.	No. pair.	Per pair.
3 1/4 inch.....	3/4 to 1 1/4 inch	63.....	\$1.00, 1.53, \$1.20
4 ".....	1 " to 1 1/4 "	64.....	1.25, 1.54, 2.00
5 ".....	1 1/4 " to 1 3/4 "	65.....	1.50, 1.53, 2.25
6 ".....	1 3/4 " to 2 "	66.....	2.00, 1.56, 2.75
7 ".....	2 " to 2 1/4 "	67.....	2.50, 1.57, 3.25
8 ".....	2 1/4 " to 2 3/4 "	68.....	3.50, 1.58, 4.50
9 ".....	2 3/4 " to 3 "	69.....	4.50, 1.59, 6.00
10 ".....	3 " to 3 1/4 "	70.....	6.00, 1.57, 7.50

Double Acting.			
		Japanned, with Nickel Plated Tips and Tubes.	
Length of Flanges.	For Doors.	No.	Per pair.
3 1/4 inch.....	3/4 to 1 1/4 inch	83.....	\$1.60, \$1.83, \$3.60
4 ".....	1 " to 1 1/4 "	84.....	2.00, 1.84, 4.00
5 ".....	1 1/4 " to 1 3/4 "	85.....	2.50, 1.83, 4.50
6 ".....	1 3/4 " to 2 "	86.....	3.50, 1.86, 5.50
7 ".....	2 " to 2 1/4 "	87.....	4.50, 1.87, 6.50
8 ".....	2 1/4 " to 2 3/4 "	88.....	6.50, 1.88, 9.00
9 ".....	2 3/4 " to 3 "	89.....	9.00, 1.89, 12.00
10 ".....	3 " to 3 1/4 "	90.....	12.00, 1.90, 15.00
Japanned, Japanned, with Cop'r with Brass Brads. Tips Plated Tips and Tubes. and Tubes.			
Length of Flanges.	For Doors.	No.	Per pair.
3 1/4 inch.....	3/4 to 1 1/4 inch	1,688.....	\$3.00, 1.73, \$3.60
4 ".....	1 " to 1 1/4 "	1,684.....	4.00, 1.74, 4.00
5 ".....	1 1/4 " to 1 3/4 "	1,668.....	4.50, 1.73, 4.50
6 ".....	1 3/4 " to 2 "	1,686.....	5.50, 1.76, 5.50
7 ".....	2 " to 2 1/4 "	1,687.....	6.50, 1.78, 6.50
8 ".....	2 1/4 " to 2 3/4 "	1,688.....	9.00, 1.78, 9.00
9 ".....	2 3/4 " to 3 "	1,689.....	12.00, 1.79, 12.00
10 ".....	3 " to 3 1/4 "	1,690.....	15.00, 1.79, 15.00

They have also commenced making a Gem Screen Door Pull, which is manufactured of Wire, Walnut Bronze, and is sold at \$2 a gross, discount 55 per cent.

Their Gem Wire Coat and Hat Hook they are now making in Polished Brass in addition to the Walnut Bronze and Nickel Plated, with which the trade are familiar. Their list for the three styles of finish is as follows, subject to a discount of 45 per cent.:

Size.		Walnut Bronze.	Nickel Plated.	Polished Brass.
1 inch.....	No. Pr. gr. No. Pr. gr. No. Pr. gr.	50.....\$1.75, 450.....\$4.75, 750.....\$10.00		
3/4 ".....	60.....2.00, 460.....5.00, 760.....11.00			
3 ".....	70.....2.40, 470.....5.40, 770.....13.50			
3 1/2 ".....	80.....3.00, 480.....6.00, 780.....16.50			

The catalogue also contains their Walnut, Empire, Acme and American Spring Hinges, the Gem and Star Spiral Door Springs, and the Torrey and Bee & Rod Door Springs and other goods. The discounts on the whole list are as follows, some of them being changed, as our readers will observe, from former quotations:

		Dis. per cent.
Empire Spring Hinges.....		60
Acme ".....		75
American ".....		80
Gem ".....		80
Gem Door Springs, Japanned & Coppered.....		55
Star ".....		Galvanized & Nickel-Plated, 40
Japanned & Coppered.....		60
Torrey ".....		Galvanized & Nickel-Plated, 40
Bee ".....		Galvanized & Nickel-Plated, 40
Gray ".....		Galvanized & Nickel-Plated, 40
Gem Screen Door Pulls.....		55
Ratchet Bed Keys.....		15

Show Case Spring Hinges.....	35
Gem Wire Coat and Hat Hooks.....	45
8 Angles, Malleable.....	50
Domestic Blind Adjusters.....	30

THE HIPLEY MANUFACTURING COMPANY, Unionville, Conn., have issued the following discount sheet on the line of Light Hardware, Tools and House-furnishing Ware which they manufacture:

Catalogue No. 5.		Dis. per cent.
Page.		
10, Boot Jacks, Automatic.....		35
11, " Tourists' Folding.....		35
8, Bung Starts.....		35 1/2
Bird Houses (see below).....		35
6 and 7, Carpet Hammers, Nos. 200 and 250.....		40
7, Carpet Hammers, Magnetic.....		35
6, Cover Lifters, Handled.....		35
14, Hand Screws.....		35 & 10
4, Lemon Squeezers, Porcelain Lined.....		35
4, " Wood.....		35
7, Magnetic Tack Hammers.....		35
8 Angles, Malleable.....		50
3, Mouse Traps, Common Sense.....		50
12, Oil Pumps.....		35
16, Police Clubs.....		35
5, Potato Mashers.....		35
10, Roofing Copper Handles.....		50
13, Saw Vises.....		35
6, Steak Hammers.....		40
16, Soldering Copper Handles.....		35
10, Seat Sticks, hand-made.....		30

They also make the Sunny Side Cottage Bird Houses, which are described as painted in two colors, neat, useful and attractive; size, 6 x 6 x 6. Price per dozen, \$3, subject to a trade discount of 25 per cent.

NEW GOODS.

The Eberhard Manufacturing Company, Cleveland, Ohio, have commenced making a line of Malleable Iron Screws and Adjustable Clamps from new patterns, extra strong. The thread is machine-cut and the Clamps are japanned, packed in paper boxes and recommended as equal to any in the market. They report that trade has greatly improved in the last two or three weeks and that orders have been for fair amounts, apparently for urgent wants.

Alcott & Smith, New Britain, Conn., for whom Messrs. Graham & Haines, of 113 Chambers street, New York, are agents, have issued a circular showing some of their Hardware specialties, a description of which is given in another part of this paper. Among these we mention the Perfect Coat and Hat Hook, made under Alcott's patent, which is sold from the following list, subject to a discount of 50 per cent.:

No.		In. Hook.	Per gr.
1, Plain Iron, Japanned.....	3	\$5.00	6.35
2, " " " ".....	3 1/2	6.35	6.12
11, " " " ".....	3 1/2	6.12	6.06
12, " " " ".....	3 1/2	6.06	5.82

4, Figured Iron, Amber Bronzed..... 3 1/2 5.82
If packed with Screws, same finish as Hooks, add 35 cents to net gross price.

5, Figured Iron, Nickel-Plated, with Screws..... 3 1/2 \$1.32
20, Figured Iron, Genuine Bronze, with Screws..... 3 1/2 4.44
30, Figured Iron, Bronze, Black Matting, with Screws..... 3 1/2 5.04
Packed one dozen in a box, three gross in a case.

They also offer Piper's Improved Gentlemen's Gem Carriage Wrench. This article is made of two sizes—No. 1, for 1/4 and 3/8 inch nuts; No. 2, for 1/2 and 1 inch nuts—both sizes being sold at \$10 per dozen, subject to a discount of 45 per cent.

Arnold's Patent Wagon and Carriage Jack is sold at \$27 per dozen for a 30-inch Jack, subject to a discount of 33 1/2 per cent.

The catalogue for 1884 of W. P. Kellogg, Troy, N. Y., for whom the Ross & Fuller Association, No. 97 Chambers street, are agents, has been issued and contains a number of new goods. Among these may be mentioned their Back-Grasp Curry Combs, made in a variety of styles, special attention being called to their Back-Grasp Horse-Shoe pattern, an article which they are now for the first time putting upon the market. This Comb, which has some of the features of the Horse Shoe pattern, is made with either open or closed back, and has an exceptionally satisfactory handle. The use of a list on these goods is dispensed with and net figures are quoted.

The following is the price list of the Attwell Burglar-Proof Sash Lock and Ventilator, which is manufactured by the Attwell Manufacturing Company, 162 Main street, Cincinnati, Ohio. Our readers will remember the illustrated description we gave of this article in a recent issue. On small orders 25 per cent. discount is allowed, but on orders for more than one gross the discount is 33 1/2 per cent. The list is as follows:

No.	Style.	Size.	Finish.	Key Head.	Length of Key.	Price per dozen.
100...	A	1 or 2	Tucker, Bronze.	0 or 00	4 1/2, 5 1/2 or 6 1/2	\$3.00
150...	B	1 or 2	"	0 or 00	4 1/2, 5 1/2 or 6 1/2	\$3.50
200...	A	1 or 2	Nickel Plate.	0 or 00	4 1/2, 5 1/2 or 6 1/2	4.00
250...	B	1 or 2	"	0 or 00	4 1/2, 5 1/2 or 6 1/2	4.50
300...	A	1 or 2	Real Bronze.	0 or 00	4 1/2, 5 1/2 or 6 1/2	5.00
350...	B	1 or 2	"	00	4 1/2, 5 1/2 or 6 1/2	5.50

Keys—Separate from Locks.

For Locks, Style "A" or "B."		Finish.	Shape of Key Head.	Length of Key.	Price per doz.
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ery here. We quote No. 1 Irons as follows: Coltness, \$22.50 @ \$23; Shotts, \$22.50; Langloan, \$22.25 @ \$22.50; Summerlee, \$21.50; Dalmellington, \$20.75; Clyde, \$20.50; Gartsherrie, \$22.50 @ \$23 from yard, \$21.75 to arrive; Eglinton, \$20.25 to arrive; Carnbroe and Glengarnock, \$22.50 from yard and \$22 to arrive.

English Bessemer Pig.—No new business is reported, quotations from the other side being somewhat firmer, while buyers' views, on the contrary, incline to still lower rates. Quotations are \$20 @ \$21, delivered here, which are evidently much above the rate at which business might be done.

Spiegel Eisen.—At present matters in this line seem to be at a standstill, owing to a similar condition of affairs to that which prevails in Bessemer Pig Iron. Sellers quote \$28.50 @ \$29, but buyers do not seem inclined to follow the upward movement.

Bar Iron.—Business is not in an entirely satisfactory condition, although the demand for mill lots so far this month has been considerably in excess of last month; but prices are no better than they were, and makers seem indifferent about extending their sales, claiming that there is no money in the manufacture of Bar Iron. Quotations are consequently sustained, because sellers are not pushing their stock upon the market. Inquiries are numerous, but they appear to be of the "shopping" character, as they lead to very few transactions in proportion to their number. Store trade is still confined to small lots, and is without animation. We quote as follows: Best Refined, from store, 2.15¢ @ 2.3¢; at mill, 1.85¢ @ 2.1¢; Common Iron, from store, 2¢ @ 2.1¢, and at mill, 1.7¢ @ 1.75¢.

Structural and Shaped Iron.—Considerable work is being entered in a quiet way, and this branch of the Iron trade appears in conspicuously good shape at present. Quotations, however, are unchanged, as follows: Angles, 2.4¢ @ 2.6¢ from store; Tees, 3.2¢ @ 3.5¢ from store; Beams, 3.5¢ on wharf for round lots.

Plate Iron.—The boiler-makers in this immediate vicinity are securing more orders, and the improved condition of their trade is reflected in the increasing quantities of Plates which are being called for. Full prices are obtained as follows: Common or Tank, 2.4¢ @ 2.6¢; Refined, 2.7¢ @ 2.75¢; Shell, 3¢; Flange, 3.4¢ @ 4¢; Extra Flange, 4.4¢ @ 5¢.

Sheet Iron.—Sales are of an irregular character, some dealers reporting a fair volume of business, while others find their particular trade quiet. Some of the mills which supply this market have notified their agents here that orders are increasing and the prospect for an active season is brightening. For Heavy Sheets, Nos. 10 to 16, we quote 3¢ @ 3.2¢. Lighter sizes are quoted in our New York Wholesale Price List.

Steel.—Indications of an improving demand are visible, and merchants are hopeful that the long period of dullness is nearing an end. Sales are somewhat larger in size and more frequent in number. Prices show no improvement, but continue at about the following range: American Tool Steel, 10 1/2¢, with a concession to large buyers; Crucible Machinery, 6 1/2¢ @ 7¢; Bessemer and Open-hearth Machinery, 3 1/4¢ @ 4¢; Tank Steel, 4¢; Boiler Plates, 4 1/2¢ @ 5 1/2¢, with extra for special sizes; English Tool, 15 1/2¢.

Steel Billets.—Iron mills are developing a strong tendency to devote more attention to the manufacture of Steel Bars and Shapes, and consequently they are in the market for Billets of special carbons from which to manufacture a product that will supersede the better class of Iron. Domestic Steel manufacturers do not seem willing to meet the prices at which foreign Billets can be laid down here, and consequently orders are being placed abroad. The largest order of this kind which has come to our notice is one of 1100 tons. The terms are private, as negotiations are made separately for each lot purchased.

Steel Rails.—We are reported transactions for the past week aggregating some 14,000 tons. Of these sales a block of 10,000 tons was taken by a Western mill. Part of the remainder consisted of light sections, 500 tons of 35-pound Rails having been sold at \$3 at an Eastern mill. The sales of heavy sections were stated to have been made at rates varying from \$35 to \$36 at mill. Inquiries are becoming a little more abundant, and makers are somewhat firmer in their views. The sellers at \$34 are fewer and the quotation of \$35 at mill is becoming general.

Old Material.—There has been an increased movement in this line during the past week. Sales of some 600 tons of No. 1 Wrought Scrap have been made at about 1¢ 1/2 lb. from yard. Inquiries are in hand for other lots. Wrought Scrap is not in abundant supply, although there is possibly enough in stock here for present requirements. In Old Rails several transactions have been reported, 700 tons having been sold at \$22, delivered at New London, Conn.; 200 tons at Perth Amboy, at a shade under \$23, and 1000 tons having arrived here by steamer from New Orleans, which were sold on private terms previous to arrival. It is stated that other lots are on the way here from the same point. The severe weather of the early part of the winter, and the prolonged rains of the past few weeks, have interfered with the collection of old material and with the repairing of railroad tracks, so that there has for some time been less offering in

this line than usual; but it is expected that as soon as better weather prevails and outdoor activity is resumed, heavier stocks will be available, and prices may then rule lower. A sale of 50 tons of Old Car Wheels is reported at \$18 on board cars at Jersey City.

TRANSACTIONS ON THE NEW YORK METAL EXCHANGE.

The following transactions are reported to us as having occurred on the floor of the Exchange from Wednesday noon of last week to Wednesday noon of this week:

WEDNESDAY, February 13.—Second Call.	
15 Tons Straits Tin, April	\$18
THURSDAY, February 14.	
25 tons Straits Tin, spot	17 3/4
25 " " April	18
55 " " spot, on dock	18
25 " " March	17.90
TUESDAY, February 19.	
25 tons Straits Tin, April	17.95
25 " " "	18

On the days not enumerated there were no transactions. The sales aggregated 165 tons of Tin at 17 3/4¢ @ 18¢.

The furnace reports which the Secretary of the Exchange has received for the month of January indicate a very decided reduction in stocks of Pig Iron during the month, as well as a decreased production by the furnaces in blast. His reports cover 235 furnaces, of which 58 were in blast on February 1, and 177 were out of blast. The following are the aggregate statistics of stocks and production from the furnaces reporting, and they fairly indicate the condition of affairs throughout the country:

All grades.	Unsold stocks.		Production.	
	Tons.	Value.	Tons.	Value.
Jan. 1, Feb. 1	In Dec.	In Jan.		
Anthracite	30,495	26,835	22,152	30,182
Bituminous	40,621	41,969	44,880	38,381
Charcoal	48,797	42,582	16,290	9,018
Grand total	128,883	111,176	83,322	67,281

METALS.

Copper.—The market during the week has presented no new features, and, after the sale of some 150,000 lb Lake Superior at 14 1/4¢ @ 15¢, closes quiet at this figure, while other brands are worth 14¢ @ 14 1/4¢. London has recovered 10¢ on Chili Bars, which are cable last night \$56. 10¢. Best selected being worth, as before, \$63. To-day we are cable from there to the following effect: "Market irregular. Best Selected quoted \$62. 10¢ @ \$63, and Chili Bars \$55. 10¢ @ \$56." Manufacturers may be quoted as under: Bottoms, 24¢; Braziers, 24¢; Sheet, 22¢, and Bolt Copper, 24¢.

Tin.—The quotation for Straits Tin per cable from London last night was \$82. 12¢, and to-day we are cable Best Straits Ingot, spot, is \$82. 10¢ @ \$83. 5¢, and futures \$83. 5¢ @ \$83. 15¢. The market here has meanwhile remained quiet at 17 3/4¢ @ 18¢ for large lots, and 18¢ @ 18 1/4¢ for jobbing lots. Shipments from the Straits settlements to the United States in all 1883 have been 6838 tons, against 6522 in 1882, and 4955 the year before; during the first half of the current month they have been 150 tons; to England, 400. **Tin Plates.**—Our market has remained quiet. We quote at the close, large lines, ordinary brands, 7¢ box; Charcoal Bright, \$5.62 1/2 @ \$5.75; do. Ternes, \$4.95 @ \$5.12 1/2; Coke Tin, \$4.90 @ \$5; and do. Ternes, \$4.75. Liverpool has also been quiet, Charcoal at 18¢ @ 19¢, and Coke at 15¢ @ 16¢. From London we are informed that Tin Plates are irregular.

Lead.—The purchasing by the one speculative party in the market has continued, and to the 500 tons we reported sold at \$4.10 last week, 900 tons have been added since at \$4.10, which is the closing figure on a very strong market. Refined being worth as much. St. Louis is strong at \$3.81. From London we are wired to-day as follows: "Lead is a little weaker. Common English Pig, \$11. 15¢ @ \$12." Manufacturers are quoted as follows: Lead Pipe, 6 1/4¢; Sheet Lead, 7 1/4¢; Tin-lined Lead Pipe, 15¢, and Block-Tin Pipe, 45¢, less the discount to dealers.

Spelter and Zinc.—Common Domestic Spelter continues in a very unsatisfactory condition at 4 3/4¢, there being no demand to speak of. Silesian is, as heretofore, nominally 5¢ @ 5 1/4¢. Bertha Refined remains 8¢. Sheet Zinc has been very quiet at 5 1/4¢ @ 5 1/2¢, at which figure it closes.

Antimony.—The market has been moderately active at firm prices, closing at 11 1/4¢ Hallett, and 12¢ Cookson.

COAL.

The Anthracite Coal trade is quiet, with no special features. Prices are pretty firm, especially for manufacturing sizes, and may be quoted f.o.b. Broken and Egg, \$4; Pea, \$2.75 @ \$3; Steamer and Grate, \$3.75 @ \$4. The half-time output at the mines is sufficient for present demands, and no change in this respect is probable, perhaps not before May, although a largely increased business is looked for when navigation opens, say about March 18th. Steamer Coal has been offered at very low prices on account of the competition of Bituminous. It is reported that Cumberland operators are quietly taking contracts in advance of the commencement of a new arrangement between the Pennsylvania and Baltimore and Ohio railroads; but nothing is definitely known. Special efforts are making in the direction of a substitution of Bituminous for Anthracite, in hopes of opening a wider field. Clearfield and Cumberland are quoted about \$3.75 @ \$4.10 alongside.

Anthracite Coal production this year to date, 2,563,142 tons, and to the corresponding period last year, 2,827,293 tons.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Brass, heavy	109 @
" light	107 @
Composition, heavy	111 @
Lead, heavy	108 1/2 @
Lead, light	108 @
Zinc	102 1/2 @
Pewter, No. 1	14 @
" No. 2	10 @
Wrought Iron	20.00 @
Light	12.00 @
Stove Plate Iron	10.00 @
Machinery	14.50 @
Grate Bars	4.50 @
Stereotype Plates	10 @
Electrotype	10 1/2 @
Small Type	10 @

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	10 @
White Cotton, New	10 @
White, No. 1	10 @
Second	10 @
Soft Woollens	10 @
Fixed Rags	10 @
Gunny Bagging	10 @
Butts	10 @
Kentucky Bagging	10 @
Book Stock	10 @
Newspapers	10 @
Waste Paper and Scraps	10 @
Kentucky Bale Rope	10 @

FOREIGN TRADE MOVEMENTS.

The following shows the imports of hardware and metals at this port for the last week, ending February 15:

	Pkgs.	Value.
Anvils	185	\$1,845
Aluminum	1	882
Brass goods	27	2,390
Bronzes	7	655
Chains and anchors	55	2,497
Clocks	12	1,115
Copper	10	123
Cutlery	114	15,141
Hardware	47	1,472
Iron, hoop	13	18
Iron, pig, tons	1,338	32,161
Iron, sheet, tons	61	4,847
Iron ore, tons	611	2,586
Iron, other, tons	555	12,036
Railroad bars	2,454	1,648
Lead, pigs	3,735	13,158
Machinery	164	1,041
Metal goods	296	2,430
Nails	16	338
Needles	96	8,152
Nickel	11	2,635
Platina	2	31
Plated ware	3	252
Pumpbago	150	961
Percussion caps	33	4,881
Pins	48	2,068
Saddlery	107	5,658
Steel	55,172	1,587
Spelter	60,749	296,498
Tin, boxes	167,020	1,070
Tin, 9,400 slabs	872,228	9,080
Zinc	15,653	698

The following is a comparison with previous dates:

	For the week	7 weeks	1883	Same time
Cutlery, pkgs.	101	716	1,030	1,030
Hardware, pkgs.	47	42	228	228
Iron, R. R. bars	2,454	9,220	40	40
Lead, pigs	3,735	5,353	109	109
Steel, pkgs.	55,172	82,194	268,615	268,615
Tin, boxes	60,749	218,707	241,373	241,373
Tin slabs, lbs.	872,228	2,770,127	2,873,355	2,873,355

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York for the Week ending Feb. 19, 1884.

Hardware.	Lundberg Gust.
Baker Hermann.	Bills, 128
Hardware, cutlery	Rods, coils, 231
and guns, 42	Mason John W. & Co.
Burkshaw W. E.	Naylor & Co.
Packages, 4	Rivet wire, coils, 329
Field Alfred & Co.	Flock & Co.
Chains, cks., 5	Wire rods, bbls., 1485
Gerard Otto.	Williamson Jas. & Co.
Bales, 14	Pig, tons, 460
Bundles, 178	Rods, bbls., 7539
Graef Cutlery Co.	Wire rods, pkgs., 152
Cutlery, cs., 5	Band iron, pkgs., 3420
Johnson & Co.	Wire rods, bbls., 3218
Machinery, pkgs., 18	Wrought tubes, lot, 1
Kemp Richard.	
Cask, 1	
Lamarche H. & Sons.	
Mos, 2	
Livingston Morris.	
Nails, bags, 398	
Merch. Dis. Co.	
Guns, case, 1	
Moss, 2	
Files, cks., 2	
Montgomery & Co.	
Packages, 2	
Mulford, Cary & Conk-	
lin, 1	
Oester W. C.	
Mach'y, pkgs., 11	
Ranscy & Co.	
Mach'y, pkgs., 11	
Schoverling, Italy &	
Gales.	
Misc., cs., 31	
Guns, cs., 2	
Sellers W. B.	
Cases, 2	
Spencer Arms Co.	
Tubes, cs., 5	
Taylor Thos.	
Cases, 7	
Ward	
Cutlery, cs., 8	
Cases, 3	
Wiebach & Hilger.	
Cutlery and hdw.	
Witte John G. & Bro.	
Cutlery, cs., 2	
Coddington T. B. & Co.	
Tin plates, bxs., 96	
Hendricks Bros.	
Lead, pigs, 375	
Ketchum E. & Co.	
Tin plates, bxs., 628	
Lazarus A. S. & Co.	
Old metal, cs., 2	
Phelps, Dodge & Co.	
Tin plates, bxs., 3002	
Winter & Smilie.	
Tin slabs, 716	
Wittermann Bros.	
Pig, tons, 400	
Hunter Wm.	
Tel. wire, case, 1	
Lawrence, Johnson &	
Co.	
Old car wheels, 246	

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending February 19, 1884.

Dutch West India.	Quan.	Val.
Ptm., gals.	3993	\$427
Mach'y, pkgs.	2	94
Mf. iron, pkgs.	7	70
Clocks, pkgs.	3	84
Scalcs, cs.	8	188
Cutlery, cs.	8	163
Nails, bxs.	6	124
Hdw., cs.	2	682
Sew. ma., cs.	10	280
Stampware, cs.	12	280
Dutch Guinea.	Quan.	Val.
Clocks, cs.	9	172
Ptm., gals.	5000	600
Hamburg.	Quan.	Val.
Cartridges, cs.	3	945
Pistols, cs.	1	196
Cutlery, case, 1	75	

Antwerp.

Quan.	Val.
Ptm., gals.	39,000
Ag. imp. pkgs.	15,170
Mach'y, pkgs.	1
Rivets, case	1
Mf. iron, pkgs.	1

Amsterdam.

Quan.	Val.
Ag. imp. pkgs.	4
Mf. iron, pkgs.	9
Ptm., gals.	766,100
Hdw., cs.	17

Copenhagen.

Quan.	Val.
Ptm., gals.	116,437

London.

Quan.	Val.
Hdw., pkgs.	116
Clocks, pkgs.	35
Ag. imp. pkgs.	914
Filters, cs.	5
Tubing, case	1
Scalcs, cs.	34
Sew. ma., cs.	183
Wire, case	4,721
Mach'y, pkgs.	47
Plumb. mat'l.	45

Liverpool.

Quan.	Val.
Scalcs, cs.	3
Cutlery, case	1
Pistol, cs.	4
Ag. imp. pkgs.	4
Sew. machin's	151
Bar iron, pcs.	703
Pumps, pkgs.	8
Hs. nails, bxs.	3,352
Mach'y, pkgs.	218
Hdw., pkgs.	39
Guns, cs.	2
Door springs, cs.	5
Mf. iron, pkgs.	233
Clocks, pkgs.	507
M. rollers.	7083
Wire clothes	1
Gaws	5
Ptm., gals.	140,250
Cop. bags	2900

Rotterdam.

Quan.	Val.
Ptm., gals.	258,000
Wringers, cs.	34
Hdw., pkgs.	30

Hull.

Quan.	Val.
Ag. imp. pkgs.	574
Iron pipe, pcs.	3063
Hdw., pkgs.	41
Mf. iron, pkgs.	1,000
S. rollers, cs.	75

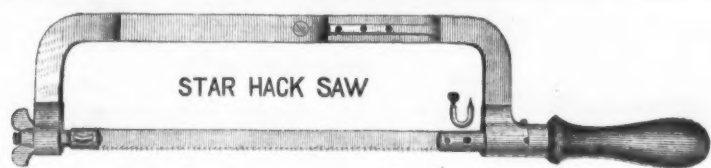
Falmouth.

Quan.	Val.
Ptm., gals.	392,700

Glasgow.

<i>Falmouth.</i>		Solder, ca.....	2	156
Ptln., gals.	392,700	43,197		
<i>Glasgow</i>		<i>Porto Rico</i>		
Ptln., gals.	9650		1,152	
Ag. imp. pkgs	22	916		
Iron safe.....	1	235		
Pumps, pkgs.	1	39		
Mf. iron, pkgs.	68	837		
Mach'y, pkgs.	21	4,460		
Steam pumps.	2	3,753		
Acc. ins.	1	100		

your account I should, of course, be



STAR HACK SAW

MEDINA, OHIO, Feb. 1, 1884.
Millers Falls Co., 74 Chambers St., New York:

GENTLEMEN—Please send me 12 more of your new Hack Saws like the sample sent a few days ago. It cuts truly wonderfully. Our machinist sawed off a round bar of steel, 1 1/2 inches in diameter, in about three minutes. Just as soon as he cut it off he handed over the money for the saw, declaring it was his property.

Respectfully,
A. I. ROOT,
Publisher of "Gleanings in Bee Culture."

KANSAS CITY, Mo., Jan. 30, 1884.

Millers Falls Co., New York City, N. Y.:

Inclosed please find \$3 for two of your Star Hack Saws and two dozen saw blades for same. The two sets were received to-day which were ordered last week, and their performance is so satisfactory that two of my friends asked me to send for sets for them.

Very respectfully,
R. H. BACOT.

MOSS POINT, Miss., Jan. 19, 1884.

Millers Falls Co., 74 Chambers St., New York:

GENTLEMEN—Please find inclosed \$3.05, for which please send two dozen "Star Hack Saws" (\$12.40), and one extra dozen 8-inch saws (6 cents) as per your price list. The Hack Saw you sent me a few days ago is THE thing. The two dozen more ordered are for mechanics in my immediate neighborhood. You may expect further orders soon.

L. M. HAND,
Manufacturer of Steam Engines, Gang and Circular Saw Mills, Brass and Iron Castings, Forgings, &c.

YANKEETON, Dak., Jan. 15, 1884.

Millers Falls Co., 74 Chambers St., New York:

GENTLEMEN—Send me one Star Hack Saw as good as you lately sent Mr. E. C. Johnson, my tenant. Find inclosed \$1.50.

A. W. BARBER.

We have sold many thousands of these Star Hack Saws, and, so far as we have heard, every one of them has given satisfaction. Hardware Dealers in all places will promote their own and the interests of their customers by keeping these goods in stock. There is a fair profit on them and not a bit of risk, as we will take back at any time all the saws which you wish to return, and pay freight both ways. Send for Price List.

MILLERS FALLS CO.,

74 Chambers Street, - NEW YORK.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
DURRIE & McCARTY, Sole Agents.

BONNEY VISE AND TOOL CO., Limited,

MANUFACTURERS OF

Bonney's Pat. Vises,

Machinists' Tools and Hardware Specialties.

OFFICE AND WORKS

3015 CHESTNUT ST., PHILADELPHIA, PA.

As an evidence of the popularity of Bonney's Patent Vises, we have sold over 300,000 of them within the past four years, and the demand is still increasing.

H. B. SEIDEL.

W. HASTINGS.

E. T. CANBY.

SEIDEL, HASTINGS & CO.,

WILMINGTON, DELAWARE

MANUFACTURERS OF

BEST CHARCOAL BOILER PLATES, AND PLATE IRON GENERALLY.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30 1/2 per centum. Our prices are as low as the production of a good article will admit of.



VARIETY IRON WORKS.

ALFRED C. REX & CO.,
MANUFACTURERS OF
Hardware Specialties,
IRON TOYS AND NOVELTIES.

Main Office and Factory, Frankford, Phila.
Phila. Sample Office, 415 Commerce St.
New York Branch Office, 128 Chambers St.
BRAMHALL & SPIER, Managers.
Send for Catalogue.

S. CHENEY & SON,

MANLIUS, N. Y.

MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS

METAL PATTERN MAKERS AND JAPANNERS.
Correspondence solicited.

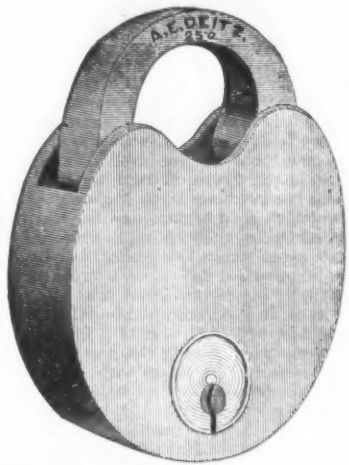


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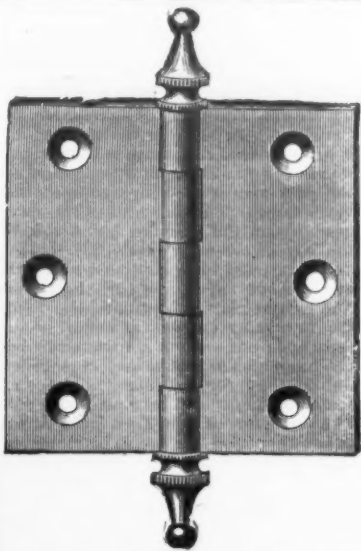
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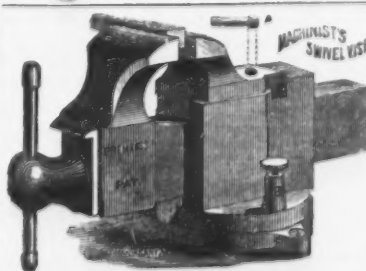
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you prompt intelligence by cable. That being so, I need not dwell hereupon now further than to reiterate my observation that our future is once more apparently in your hands. It had been thought that the American market was no longer "the key to our iron trade," as the old phrase went, but happenings often come about very strangely, and it would now be scarcely astounding to find an improvement with you followed by a decided change for the better here.

The doings of your Congressmen on tariff matters are being followed with an amount of attention which may almost be styled languid, yet which is possessed of a base sufficiently broad to permit of a rapid expansion should circumstances arise to lead to the hope that a sound measure stood any chance of passing this session. Unless the change threatened by the Democrats should be really radical, I fancy our manufacturers and exporters would much prefer that there should be no alteration at all. As a matter of course, we of this country have no actual concern in your Congressional proceedings, but as we happen to be near relations, and still do a considerable business with you, any material alteration in your tariff must also affect us, and cause us more or less trouble in adapting ourselves to the incidence of the new state of affairs. It is telegraphed that the Ways and Means Committee are likely to recommend a general reduction in your tariff of 20%, but, as that drop would virtually extinguish a goodly number of the present duties, the statement is regarded as being "too good to be true"—that is to say, we don't quite believe that there is the most remote chance of such a reduction being adopted. We are curious to note the outcome of the tariff fight, but there are few Britishers who are sanguine enough to flatter themselves that you are about to forsake protectionism.

THE IRON MARKET

has been a shade quieter on the week, especially in the open markets of Scotland and the North of England, where the general dullness of trade and the results of speculative movements have had the effect of bringing about a slight relapse from the tentative activity of a week or two back. So far as can be judged from the trade reports of the period and the average tenor of conversation in the trade, there is no improvement noticeable in any branch of importance. In some departments there is still a fair turnover, but profits are said to be quite meager, and there is a constantly-growing keenness of competition for such new orders as are from time to time put forward. The makers of almost all kinds of shipbuilding iron are experiencing a diminished demand, which will shortly have somewhat serious results upon the rolling mills of the North. At present these mills are tolerably well engaged in the completion of old contracts, but the end of this quarter will find their books very bare unless some change for the better should take place in the meantime. As a consequence of this almost universal depression, prices have become nominal all round, and the actual figures realized are in scarcely any case those published or put forward on lists. On the whole, therefore, the situation must be deemed anything but favorable, while the outlook is very dull. At the same time, there are those who look for an amendment before long, especially if the improved condition of your iron market should gain strength. From one cause or another the production of pig iron in this country is now being very considerably restricted, yet the stocks appear to be growing in many quarters; hence it seems likely that a yet larger method of restriction will have to be put in force as a means of meeting the lessened consumption. The Northamptonshire ironmasters held a meeting on Tuesday, January 29, and had a long discussion as to the state of their trade. It is understood that they met in order to arrange the details of a general scheme for effecting a limitation of the output, and I believe that something of the kind was settled, but, as the meeting was a private one, I am not able to state more specifically the decision arrived at. In other parts of the country the smelters are reducing their make as much as possible, with exceptions in two or three instances where the rise in Cleveland pig seems to afford the opportunity of more successfully competing with it.

At Glasgow warrants have been less feverish and rather lower in range, closing to-day at 43/3. Shipments of Scotch pig are less than last year to date, while Connal's stocks are being augmented in spite of the reduced make. Makers' brands of Scotch pig, however, remain steady at the late advance. At Middlesbrough values are a shade easier, notwithstanding the impending limitation of the production by about 15 per cent. Shipments are only moderate, and the local consumption is decreasing. For No. 3, 37/3 @ 37/3 is quoted, but sales are reported to have been made at 36/9. It is satisfactory to all parties that the wages question has been settled by the arbitrator without a dispute. On the West Coast the strikes of the furnacemen had attained serious proportions, and many of the furnaces have been damped down, but a partial resumption has now come about on the employers' terms. Here, again, the make has been lowered by quite 25 per cent., yet stocks are not intrinsically upon, and selling values have scarcely gained a point, mixed lots in usual proportions being obtainable at 46/6 @ 47. Heavy manufactured iron is dull and rather lower, particularly ship plates, angles, bulbs and tees. In fencing wire I hear of no movements of note, despite the inducement to buyers in the shape of extremely low prices. German competition is much felt, both in rolled and drawn. As regards barbed wire, we appear to be likely to witness litigation similar to that which has been in progress for so long a time in the United States. Galvanized iron is still dull, and quotations are very bare in all directions. New markets are being sought for these sheets, but they do not compensate for the slackness of the Australian demand. As regards ordinary finished iron, I have scarcely anything that is new to report. Best Staffordshire marked bars are unchanged, but quite nominal, at £7. 10/ medium unbranded bars being £6. 10/ @ £7; ordinary, £6 @ £6. 10/ and common Welsh

£5. 2/6 @ £5. 5/ per ton for usual assortments. The sheet-iron manufacturers are doing a moderate turnover in working-up and galvanizing sorts, but none of them are really busy. Hoops are quiet at £6 @ £6. 10/. Swedish hammered bars are not very active at £9. 10/ @ £10 per ton. In iron rails the current business is small. Old rails are in rather better request, with inquiries from the United States for steam shipments of D. H. The supply of these materials is only limited. Heavy wrought strap iron is quiet at late rates. Freights are unaltered and easy, as a rule. Pig iron by ordinary steamers, Glasgow to New York, is about 5/ per ton. Steel is without other than minor alterations, and few of the manufacturers at Sheffield have more than an average amount of work in hand. The Bessemer concerns are also quiet, albeit some of them are pushing rolled sorts with much determination. Blooms for export are not wanted, nor does there appear to be much doing in crop ends. As I have previously mentioned, Siemens plate scrap is now being largely used by the nailmakers and others. For old railway leaf-spring steel there is a little stronger inquiry, chiefly on American account. Steels rails appear to have undergone a considerable improvement, entirely owing to the combination for reducing the make. I have as yet no precise details of the scheme in question, but it is understood that the limitation will be to the extent of about 20%, and will be continued so long as the depression exists. Prices have been advanced to £4. 17/6 and £5 per ton for ordinary heavy sections, and it is stated that a fair order has been placed at over £5 per ton—probably the same order as that referred to in my last letter. The dispute at Bolckow, Vaughan & Co.'s Eston Works is now virtually at an end, the majority of the men having accepted the reduction in wages of 10%.

SCOTCH PIG IRON

has been easier and has relapsed slightly in the open market as regards warrants, albeit almost all the named brands have been tolerably firm. The voluntary limitation of the output to which I have alluded in my recent letters is being continued, yet it is worthy of notice that there are heavy weekly additions to the reserve stocks, and that the shipments continue to show a decrease as compared with last year's figures. The number of operative furnaces in Scotland is now 95, against 97 last week, and 110 this date 1883. In Connal's stores there are 590,456 tons (an increment of 1982 tons last week), against 600,716 tons a year ago. These figures help the bears. The shipments to date this year have decreased by 4656 tons (all on coastwise lots), while the importations of Middlesbrough pigs into Scotland have increased by 3069 tons. Warrants are now 43/9, against 47/6 a year ago. Writing from Glasgow on February 2, James Watson & Co. said: "The Scotch iron market has been flat this week, with only a restricted business doing, and makers' iron has not been in great request, although prices remain very steady. The warrant market opened flat last Monday, the price declining from 43/6 to 43 1/2 per ton. On Tuesday it rallied to 43 1/2 to 43 3/4 per ton. On Wednesday it was rather firmer, with a small business transacted from 43/4 to 43 1/2 per ton. Yesterday it was a shade easier, the price dropping to 43/3, closing at 43/4 per ton. To-day the market recovered from 43/3 1/2 to 43 1/2 per ton, closing with sellers at the latter figure, buyers offering 43/6, cash. The shipments last week were 6819 tons, as compared with 8788 tons for the corresponding week of last year." We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow.....	45/6	48/
Clyde,	48/	45/6
Coltness,	58/	52/
Langloan,	55/	51/6
Garthshore,	54/	52/
Summerlee,	55/	49/
Calder,	54/6	48/
Carnbroe,	52/6	46/
Glenarnock, at Ardrossan.....	53/	49/6
Eglington,	47/	49/9
Dalmellington,	49/6	47/6
Shotts, at Leith.....	54/	52/
Kinnell, at Boness.....	47/	46/
Carron, at Grangemouth.....	49/	47/6

MIDDLESBROUGH PIG IRON

is very quiet indeed, and values show a slight decrement, although there is said to be a slightly better demand for forward lots. The local mills and forges, however, are beginning to show marked signs of slackness; hence all parties fear a decrease in the consumption which is hardly likely to be compensated for by enlarged shipments. For No. 3, 37/ @ 37/3 or 37/6 are current rates, while G. M. B., f.o.b. at makers' wharves in the Tees, net cash, are:

No. 1 Foundry.	41/3	Mottled.....	35/
2	39/3	White.....	34/6
3	37/3	Refined metal.....	54/
4	36/	Kentledge.....	39/
4 Forge.	35/6	Cinder.....	33/6

The Tees shipbuilders contemplate a reduction of 20% in the wages of their workmen, and in some cases notices have been served to that effect. These notices will expire at the end of February. The men agree to accept a general drop of 7 1/2%, but the employers declare that reduction would be insufficient and unacceptable.

HEMATITE PIG IRONS

are not in any sense stronger—indeed, now that most of the men who had been on strike in the West Cumberland district have gone in, the market may be said to be a shade easier, owing to the augmented production occasioned by the settlement. Mixed lots are nominal at about 47/, and West Coast makers' brands are:

	No. 1.	No. 2.	No. 3.
Cleator.....	47/6	47/	46/6
Lonsdale.....	48/6	47/6	47/
Workington.....	48/	47/6	47/
Lowther.....	48/	47/6	47/
Distington.....	48/	47/6	47/
Harrington.....	48/6	47/6	47/
Solway.....	48/6	47/6	47/
Maryport.....	48/6	47/6	47/

North of England hematite pigs, f.o.b. Cumberland ports, &c., are quoted as under:

No. or quality.	Ordinary.	Bessemer.
1.....	51/	49/
2.....	50/	47/
3.....	49/	47/
4 Foundry.....	49/	47/
4 Forge.....	49/	47/
Mottled.....	49/	47/
White.....	49/	47/

TIN PLATES

continue quiet, and the demand is somewhat less than it was. Orders just now are re-

stricted to special lines of odd sizes and squares. For these, however, somewhat better figures—6d. or so—are obtained than for ordinary sizes. As for the latter, in ordinary-grade brands it has been difficult on more than one occasion this week to obtain 15/3. Apparently there is no demand for ordinary-size cokes until they are offered by some makers who are pressing for orders; then it is that such low figures as 15/3 and 15/ are offered. The talk is that there are certain brands, or a certain brand, still offering at the latter figure, though no authenticated sale has yet been made known. The prices at which good brands can be obtained continue to be 15/6 @ 16/. Coke-tin wasters are again somewhat quieter, but 14/6 @ 15/ is obtainable, and even a trifle more occasionally for certain good brands. Charcoal turners, in good brands, are selling as low as 15/6 @ 16/. I. C. and 28 x 20, 32/ @ 32/6; others are quoting higher figures. Best cokes and steel plates with coke finish are in fair demand, but prices are low, and this will be easily seen when such figures as 16/ and 16/6 T. C. are mentioned. The freights from Liverpool direct to the States have been reduced to the very lowest point possible, 5/6 per ton, in order to get hold of the bulk of the trade in tin plates, and though the coasting steamers from Llanelli and Swansea charge only 5/ per ton, yet the Swansea steamers sailing still hold their own and secure sufficient to keep three or four going out full loaded monthly.

CARDIFF TRADE WITH THE UNITED STATES.

I am favored with the subjoined remarks by Messrs. Edwards, Robertson & Co., of Cardiff: "In perusing the annexed figures, it will be seen that there is but little alteration in the exports from this Channel during the past month as compared with the previous month. The shipment of tin plates has been about the average, but the decline in the export of other materials which has been apparent for some time past continues, and without any sign of early improvement. The freight market continues depressed, and the low rates current, as named in our last report, do not seem to stimulate the demand for shipping. There have been recent inquiries for tonnage for Baltimore, and we expect some shipments will take place this month." The shipments to New York included 105,975 boxes tin plates, 445 boxes black plates, 167 casks ferromanganese, 2 casks lead pipe, 1 crate hardware, 1 case machinery, 140 casks yellow metal and 3 iron ladles. To Baltimore, 15,781 boxes of tin plates were sent.

FOREIGN.

FRANCE.

(Moniteur des Interets Matériels.)

PARIS, Feb. 4, 1884.—Metals.—Business in general has begun to pick up a little; still, it is far from being what it should be so near the spring months. Metals have been dull and weak, each having receded a little from the previous week. We quote at the close: Copper.—Cath. Bars, 142.50 @ 147.50 francs per 100 kg.; Ingots and Slabs, 155; Best Selected, 160, and pure Corocoro Ore, 150 francs. Tin.—Banca, 230; Billiton, 225, and Straits, Australian and English, 225. Lead, 39 @ 39, and Cornish, 38.50. Iron.—No revival is as yet perceptible in the iron branch. At the North wages have had to be reduced 10%, and the week's work does not exceed four days, there being a lack of orders. Rolling mills sell at 15.25 francs. New contracts for steel rails are taken at comparatively low figures for the maker; thus the Orleans Railroad has obtained them at 178.50 francs per ton. Old rails have sold at 89 francs per ton by the Eastern Railroad Company, the latter having at the same time bought their steel axes at Cockfield's, in Belgium. The falling off in the amount of finished iron and pig imported into this city is remarkable for the first 11 months of 1883, having been only 45,500 tons of the former, against 57,365 in 1882, and 58,181 of the latter, against 45,075 in 1882. This year it is likely to be still greater, in consequence of the forcible reduction of building. At the same time, the import of steel is steady. We are now in possession of the import and export statistics for the whole of France for the year, from which it appears that there were imported last year 385,122 tons of pig, against 286,003 in 1882; 95,552 tons of finished iron, against 130,780, and 40,920 tons of steel, against 46,061. Of iron ore 1,597,306 tons have been imported, against 1,425,578 in 1882. The movement in coal has been slack—in fact, it has diminished from day to day; in the first place, because industry in France is less active than in former years, and, in the second place, because the mild weather has checked consumption for domestic use.

BELGIUM.

(Moniteur Industriel.)

BRUXELLES, Feb. 4, 1884.—Iron.—The slight spurt which was noticeable the other day in response to a temporarily better feeling in the North of France, has not lasted, and we are now about as dull again as we were before. In order to sell large lots of iron, concessions would be made on the usual quotations: English Pig, 5.30 francs per 100 kg.; Charleroi, 6.75; Puddling Domestic, 4.25 @ 5.25; Athus and Halanzy, 4.60; No. 1 Merchant, 12; No. 2, 12.75; No. 3, 13.50; Beams, 12.75, and Corners, 14.25; Sheet, No. 2, 10; No. 3, 9; Commercial, 22; Thin, 34, and No. 4, 35. Prices are so low at present that consumers will find a real inducement in them to anticipate requirements. There are indications that they soon may act in this sense. There is, besides, a rumor that has just been introduced advocating that the Government undertake to build a certain number of branch railways. The Government has hesitated a long time, but is now, it appears, ready to entertain similar views, which would, if carried out, prove an important aid to our suffering iron interests and kindred branches connected with railroad material. Of more immediate interest is the receipt of some export orders which have dropped in, and which, in view of the depression of prices here, seem to have been singularly well-timed. We indeed, believe that it will be very difficult for any neighboring nation to compete with Belgium at present in point of cheapness in iron and steel. Coal is to a notable extent affected by the quick which pervades industry in this country for the moment. Stocks have been accumulating, even in the Liege Basin. Couchant de Mons is about the only quarter where the coal demand has not abated.

GERMANY.

(Borsenbulletin.)

HAMBURG, Feb. 5, 1884.—Iron.—The attempt to maintain the price at 125 marks for Merchant by coalition and reduce the output in order to lend strength to this movement, may be very good, and, indeed, it would be an excellent measure if it kept their word strictly, but there are in Rhinish Westphalia so many whose financial requirements compel them to sell, that it will be difficult to enforce rigidly the agreement. Sheet iron still enjoys a good demand, but iron wire remains neglected under a diminished inquiry for America. Steel works have continued to do well; large orders for rails and other material have been given by the Baden Railroad. The Silesian rolling-mill owners' combination is in a fair way of dissolution, since three of the largest makers have ceased to belong to the compact. As the Hogenscheidt, Fielevinkler and Borsig have their hands free, it is useless to attempt keeping up a combination. Pig iron is in a very bad way in Upper Silesia, the demand for Poland being slack. Great stimulus had been given to export thither before the higher duty became operative in Russia with the commencement of the new year; now that it is levied the demand has ceased. This will at least have one good effect—that of establishing a better proportion between pig and finished. Meanwhile rolling mills have reduced their production very much in Upper Si-

lesia; a great drop in pig iron seems, therefore, to impend in that region. Metals.—Great dullness prevails. Lead is inactive; we quote German, 12.25 @ 12.50, and English, 14.50. Copper is weak; Lake Superior, 75.50. Tin is stagnant at 95 @ 98 marks. Spelter.—Nothing transpires in the metal, which may be quoted 15.15 @ 15.50 marks per 50 kg., spot and to arrive.

HOLLAND.

(Koch & Vlierboom.)

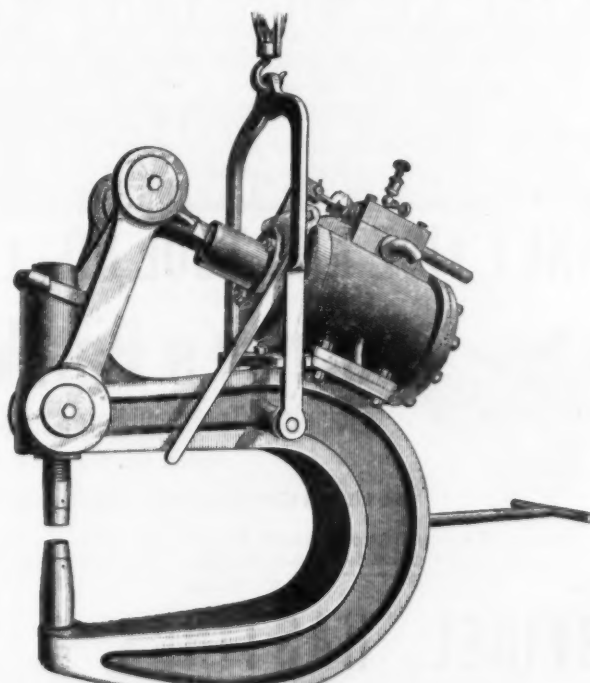
ROTTERDAM, Jan. 31, 1884.—Tin.—The Netherland Trading Society has just sold at auction 22,344 Slabs Banca at 51.37 1/2 guilders per 50 kg., on an average. The January tin deliveries in Holland have been 18,351 Slabs, against 14,049 in 1883, and 15,468 in 1882. The stock is 66,306, against 96,606 and 75,590. The price of Banca was at this time last year 57 guilders, and the year before, 67.50.

AUSTRIA.

VIENNA, Feb. 3, 1884.—Iron.—The market so far this year has been but moderately active; but has, however, been a comparatively good demand for pig iron, with a slight rise in Gray sorts, while White and Mixed are barely sustained. Quite a favorable feeling manifests itself as regards Merchant iron for spring and summer futures, but not for spot goods, the trade preferring to await the actual advent of spring ere they lay in fresh supplies. Sheets are weak and have declined 1/2 florin per 100 kg., Hungarian sorts. Rolling mills receive a steady current of moderately-sized orders, but big ones are scarce. Locomotives at the last adjudication went at 30,000 florins; our makers cannot complain of this figure, considering at what they are now offered from Germany. The iron market has been quiet; we quote pig steady in this city at 51 @ 50; Merchant, 115 @ 130; Sheets, 170 @ 195, and Beams, 140 @ 145 florins per ton. Metals have fluctuated a good deal, in sympathy with London, but, on the whole, the tendency has been a weak one, on the theory that production is larger in most of them than consumption can absorb.

The Allen Portable Pneumatic Riveter.

We illustrate in the accompanying cut a new style of portable pneumatic riveter, made by the Allen Portable Pneumatic Riveting Machine Company, of New York. The latest form of this riveter was patented but a few months ago, and already a number of them are in satisfactory operation. The jaw frames of these machines, which are made in two sizes, will straddle girders or beams having 6-inch angle irons on each side, and are 25 and 35 inches deep respectively.



The Allen Portable Pneumatic Riveter.

With 6-inch angle irons fastened on each side at the edge of the girder, the small machine will straddle the angle irons and reach 20 inches, while under the same conditions the large machine will reach 30 inches; they are thus particularly adapted for use in riveting plate girders. Reference to the cut will show the main features of its construction. The piston-rod connects to levers of different lengths, forming a toggle joint, the lower ends of the longer levers being attached to fixed centers on the frame, while the end of the central shorter lever is attached to a dolly-bar, into the lower end of which the head die is screwed. The dolly-bar has a stroke of 3 1/2 inches, and the machines are made of sufficient strength to operate on 1-inch rivets. It may be seen by the above description of this riveter that its construction is such that it acts in a direct line with the axis of the rivet.

INDUSTRIAL ITEMS.

MAINE.

The new ax factory building, at St. Stephen, is 100 x 35 feet and two stories. The concern turns out about 10 dozen axes a day, and expects to increase its production largely before long. Its chief market is in the Maritime Provinces, but the fame of the axes has spread all over the Continent, and frequently orders are received from many of the Western States and British Columbia.

MASSACHUSETTS.

The Betts Ready-Made Wire Fencing Company, at Palmer, have just begun operations. They will produce 22,500 rods of fence per month.

The Chase Turbine Manufacturing Company, at Orange, have moved most of their machinery into their new shop. The iron work will be mostly done in the new shop, while the woodwork will be done in the old one. Both water and steam will furnish motive power, and so located that both can be united in one or both shops at the same time.

The wire company, at Palmer, turned out 3000 tons of iron and steel wire last year, valued at \$400,000. About two-thirds of the product was steel wire, and one-third of the whole was galvanized. A large proportion of the whole product was used for telephone

and telegraph wire. The company have now on their books \$200,000 worth of unfilled orders.

NEW JERSEY.

The New Jersey Steel and Iron Works, at Trenton, resumed operations on February 11. The chain department, however, is idle, owing to a strike.

PENNSYLVANIA.

Messrs. Witherow & Gordon, of Pittsburgh, send us the following communication: "In your issue of February 7 we notice the excellent working of the Sheridan Furnace under the management of Charles I. Rader; but we take exception to the statement therein made, that this record is crowding that of furnaces equipped with fire-brick stoves. Last week the No. 2 Furnace at Colebrook, Lebanon County, made a product as follows:

	No. 1.	No. 2.	No. 3.	Mot'd.	Tot'l.
Sunday, Feb. 3.....	59	3	14	16	92
Monday, Feb. 4.....	75	13	..	..	88
Tuesday, Feb. 5.....	40	37	27	..	104
Wed., Feb. 6.....	72	81	..	..	104
Thursday, Feb. 7.....	17	81	27	27	102
Friday, Feb. 8.....	22	6	47	25	100
Saturday, Feb. 9.....	..	..	70	49	119

Total for the week..... 702

The consumption of fuel was 2587 pounds to the gross ton of pig iron, or at the rate of 1.155 tons of fuel to 1 gross ton of pig iron. This furnace is 14 feet bosh and has a working height of about 70 feet. It is equipped with three 18 x 55 foot modern Whitwell fire-brick hot-blast stoves, and uses a temperature of blast ranging from 1400° to 1700° F. This was the 65th week of its blast, and the average product for the entire blast was 520 1/2 tons. The average for the first six weeks of this year was 560 1/2 tons, showing a very considerable improvement on even the very high and exceptional record of the Sheridan, produced by the use of the cast-pipe stoves.

The Gautier Steel Department of the Cambria Iron Company, of Johnstown, suffered no inconvenience whatever from the recent floods in that section of the State. At one time they were seriously threatened by an ice gorge which formed just above the mills

on the Conemaugh River; it broke, however, and passed down the river without doing any damage. They report a marked revival of business, shown by the fact that they have been steadily shipping since the 1st of February all the goods they could produce, and have largely depleted their stock of manufactured products. The demand appears to be a healthy one, and based upon the actual necessities of buyers.

Joseph P. Reed & Co., of 261 South Fourth street, Philadelphia, have admitted into their firm Mr. Charles B. Richardson, and will continue their business as heretofore at the same address.

At West Middlesex, the Middlesex Rolling Mill, Fannie Furnace and the chain works were compelled to shut down during the high water last week.

The Chesapeake Nail Works of Chas. L. Bailey & Co., Harrisburg, were flooded last week and were forced to suspend operations.

The Scott Foundry, at Reading, is being run to its fullest capacity. A new 20-foot fly-wheel is being placed in position.

Creveling, Miles & Co., of Danville, proprietors of Chulasky Furnace, have purchased the old Roach Furnace at that place and will put it in operation.

Arrangements have been completed with the creditors of Blain Bros., Huntingdon, which will enable that firm to resume operations in a few days.

According to the Steelton Item, there is cheering activity in every department of the steel works of that place. Fires have been kindled in No. 3 Furnace; two turns have been put to work in the new merchant mill to enable the management to keep pace with the rapid inflow of orders; in short, everything about the works is reported as looking bright and promising.

P. L. Kimberly & Co. inform us that there is no truth in the report that W. L. Scott & Co., of Erie, are negotiating for their Greenville mill.

Last week, at a meeting of the leading business men of Uniontown, it was decided to build a plate and nail mill, the company to be called the Uniontown Rolling Mill Company, Limited. It will be a limited copartnership, with a capital stock of \$60,000. Over \$15,000 was subscribed on the spot.

WEST VIRGINIA.

The Wheeling *Intelligencer* reports the following losses in that city occasioned by the flood: Whitaker Iron Company, \$75,000; Riverside Iron Works, \$75,000; Belmont Nail Company, \$2000; Benwood Iron Works, \$15,000.

OHIO.

Phoenix Furnace, of Brown, Bonnell & Co., is again in operation, after having been banked for two months.

Andrews & Hitchcock, of Youngstown, are now putting in a new Chayahoga blowing engine at their Hubbard Furnace and expect to have it running in a week or 10 days.

Summers Brothers & Co. are putting in another Cox annealing furnace at their mill at Struthers Station, and are filling large orders for roofing iron.

The Cummer Engine Company, of Cleveland, have increased their capital stock from \$150,000 to \$400,000.

Benwood Furnace, at Martin's Ferry, though almost drowned out by the flood, is now running well and making good iron.

The Jefferson Iron Works, of Steubenville, which had a stock of several thousand kegs of nails damaged by the recent flood, tried the experiment of covering the wet nails with wet sawdust while in the blower. The result was that they came out cleaner than they were before, and a saving was effected of \$5,000.

ILLINOIS.

The Haxton Steam Heater Company, of Kewanee, are to put in their rolling mills a new 16-inch muck train, with balance rolls, which will be run by a 400-horse-power Corliss engine. They are also building several new double gas furnaces in the puddling department, and are erecting eight additional gas producers.

The works of the Northwestern Horse Nail Company will start up on the 18th inst.

H. W. Hill & Co., manufacturers of hardware specialties, of Decatur, during the year 1883 mention that they sold 18,666 improved hog rings, 22,048 old-style rings, 2518 tongs and 13,770,000 rings, being an increase in nearly all these items over their very large business of 1882.

INDIANA.

Dean Bros., of Indianapolis, have recently furnished a complete set of water works for a large lumber company at Eau Claire, Wis. They have also made a large pump for the Clarksville, Tenn., water works, besides a set of vertical pumping machinery, having a capacity of 1,000,000 gallons per day, for the Citico Furnace, Chattanooga, Tenn.

CONTENTS.

	PAGE
Tweddell's Portable Hydraulic Riveting Machine. Illustrated.	1
Metallurgical Notes:	
A New Method for the Extraction of Selenium.	1
Wolfram and its Alloys.	1
Examination of Stationary Engineers in Philadelphia.	7
Foundry Hydraulics. Illustrated.	9
Routing Machine. Illustrated.	9
New Inventions.	9
A New Clamp. Illustrated.	11
Competitive Tests for Locomotive Men.	11
Death of John M. Phillips.	13
Termination of Two Important Suits.	13
New Hardware Articles. Illustrated.	13
Iron Ore Mining in Eastern Pennsylvania.	15
The Union Pacific and Steel Rails.	15
Editorial:	
Concerted Restriction of Production.	16
The Ohio Valley Floods.	16
The Position of Tin Plates.	16
An Old Acquaintance.	16
Ocean Steamship Profits.	16
The Condition of Business.	16
A Noteworthy Policy.	17
Report of the Gun-Foundry Board.	17
Mr. Hewitt on the Tariff.	17
Washington News.	17
Trade Report:	
British Iron and Metal Markets.	21
Trade and Finance.	21
General Hardware.	21
Iron.	22
Transactions of the New York Metal Exchange.	23
Metals.	23
Coal.	23
Old Metals, Paper Stock, &c.	23
Foreign Trade Movements.	23
Imports.	23
Exports.	23
Philadelphia.	24
Pittsburgh.	24
Chicago.	24
Chattanooga.	24
Louisville.	24
Cincinnati.	24
St. Louis.	24
Baltimore.	24
Our English Letter.	24
Foreign.	25
The Allen Portable Pneumatic Riveter. Illustrated.	26
Industrial Items.	26
New York Wholesale Metal Prices.	27
Shipbuilding in Philadelphia.	29
The Iron Age Directory.	29
Combined Square and Slitting Shear. Illustrated.	30
Wilber's Door Hanger. Illustrated.	30
New Publications:	
Transactions of the American Society of Mechanical Engineers.	30
Handbook of Electric Telegraphy.	30
Mathieu Reports at Vulcan, Mich.	30
Trade Publications:	
Fire-Brick.	30
Steam Engines and Mining Machinery.	30
New York Wholesale Hardware Prices.	31
Philadelphia and Pittsburgh Hardware and Metal Prices.	43
Boston Hardware and Metal Prices.	44

MISSOURI.

The Shickle-Harrison Pipe Works, of St. Louis, have put up an additional building 200 x 80 feet, which will contain three oblong melting pits of 80 x 15 feet each, with a capacity of about 1000 tons per day. This addition is expected to be completed in a very short time.

The Laclede Wire and Fence Company, of St. Louis, have just completed and occupied an addition to their works 100 feet deep, with a frontage of 25 feet. The new building is used as a warehouse and paint shop. The company have also fitted up and occupied a new office on the first floor of their works.

The St. Louis Mail-able Iron Company, of St. Louis, are building two more new ovens, which will give them ten altogether, putting in new machinery, and making alterations which will assist in enlarging their facilities. To add to the floor space of their works their office will shortly be removed to a separate building, as yet undecided upon.

MICHIGAN.

Work is going ahead vigorously on the site of the furnace to be built by the Iron River Furnace Company, near Stambaugh. The company have cleared off a tract of 20 acres for the plant, and a force of men is now employed in excavating for a series of charcoal kilns. About 50 choppers are at work in the woods thereabout, getting out wood to be made into charcoal when the kilns are ready.—*Marquette Mining Journal*.

Shipbuilding in Philadelphia.

In the shipyard of W. Cramp & Sons, at Philadelphia, there are now on the ways in course of construction four iron steamers, which, when completed, will make the total number of this class of vessels built by the firm 243. The building of these four vessels gives employment to 1400 men and turns several acres of land into a vast workshop. The last steamer built by this company, and but recently brought to New York prior to its voyage to San Francisco, is the San Pablo, built for C. P. Huntington, for the Pacific coast trade between Portland, Ore., and San Francisco. She is 350 feet long, 42 feet beam and 30 feet deep. Her construction is solid and thorough, being intended to receive coal shipments, but her model is graceful and suggestive of speed. She will take the place of the Tacoma, lost about a year ago. In the yard itself the most striking object is the towering frame of the H. F. Dimmock, a freight and passenger steamer building for the Metropolitan Steamship Company, whose boats ply between New York and Boston. She is 265 feet long, 41 feet beam and 29 feet hold. Ranged alongside of her the iron ribs of what will be three other steamers attract attention. Only a part of the skeleton of each has been put in place. Hundreds of men are at work at these steamers, which are building for the Morgan Line, and will ply between New York and New Orleans. Each is 330 feet long, of 43 feet beam and 33 feet hold. The prospects for a busy spring and summer of vessel-building are considered by the Cramps to be very good. It is said that John D. Spreckels, of the Oceanic Company, the son of Claus

Spreckels, the Hawaiian sugar king, is now on his way from San Francisco to Philadelphia to order two more vessels for the line between California and the Sandwich Islands. The Cramps built two vessels for this line last year—the Alameda and the Mariposa—which have shown surprising qualities of speed in the Pacific waters.

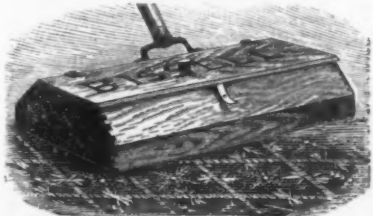
It is reported that a steamship company with \$5,000,000 capital has been formed at Philadelphia, in which the Cramps are interested. The intentions of the promoters have not been disclosed, but it is probable that the company will engage in the foreign trade.

At a recent meeting of the Board of Managers of the Franklin Institute it was announced that bids would be asked in the course of a week for the erection of the buildings for the International Electrical Exhibition to be held in Philadelphia. It is proposed to ask the official recognition of the Secretary of State, that other nations may be invited to participate.

The contract for the new bridge to be erected by the New York, New Haven and Hartford Railroad Company across the Housatonic River has been awarded to Jones & Benner, of Philadelphia. The bridge will be 1100 feet long.

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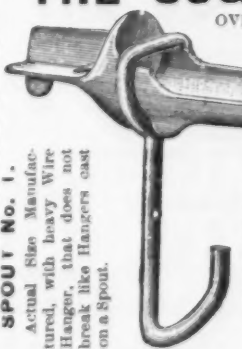
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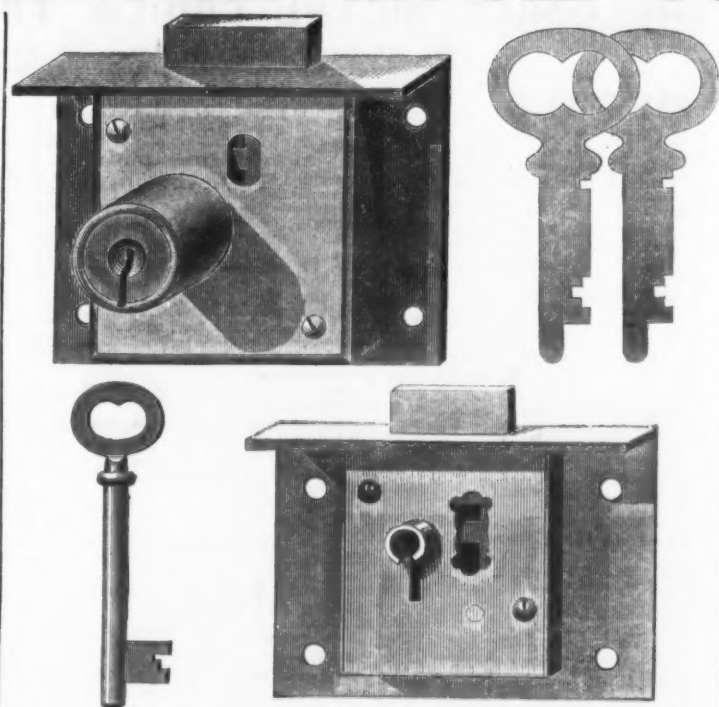


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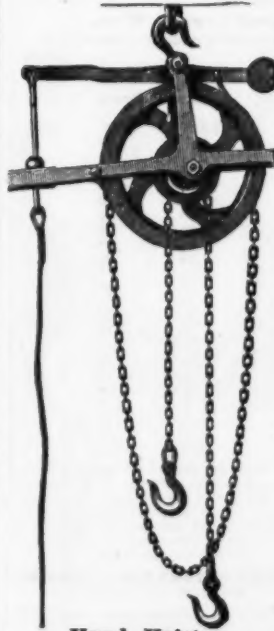
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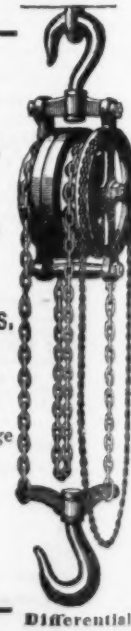
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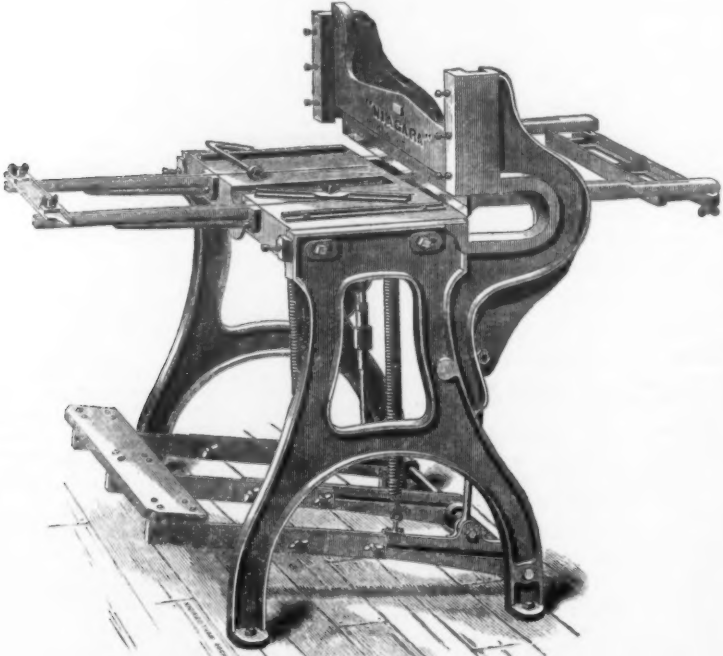
Mention this Paper.

And Index to Advertisements.

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Combined Square and Slitting Shear.

The Niagara Stamping and Tool Company, of Buffalo, N. Y., have just put upon the market a new style of square and slitting shear combined, of which the accompanying illustration presents a very satisfactory idea. As may be seen from the cut, the side cheeks of the machine are formed as a part of the legs, and are so shaped as to form a gap. This gap is 6 inches deep, and the shear blades are 37 inches long; accordingly, iron 3 feet wide is readily cut in this machine. In strength the machine is readily adapted to No. 16 gauge and lighter. The treadle is extensible, so as to adapt it for cutting various thicknesses of sheet metal. A clamping member, not shown in the engraving, is provided for holding the sheet upon the bed of the machine while it is being cut. This shear will cut a strip 6 inches wide, or narrower, of any required length.



Combined Square and Slitting Shear, Built by the Niagara Stamping and Tool Company, Buffalo, N. Y.

When used for slitting, the sheet is moved endwise across the machine, allowing several distinct cuts to be made, as may be necessary. The machine, by its capacity for work and general construction, is well adapted to the use of sheet-iron workers generally, and particularly to galvanized-iron cornice manufacturers. We understand that the Niagara Stamping and Tool Company have an illustrated circular describing their full line of squaring shears, some of which we have previously illustrated. It is to the interest of all who contemplate buying machines of this kind to learn from it what is available for their purpose.

Wilber's Door Hanger.

We show herewith a perspective view of a new barn-door hanger introduced to the trade by J. D. Wilber, No. 150 Dearborn street, Chicago. The entire hanging strap and wheels are made of malleable iron. The wheels are straight grooved, fitting the square edge of the track both above and below, thus keeping a door perfectly aligned, and not allowing it to slide in or out until stopped by rubbing against the rail, which is often the case with flat wheels on a wooden track. The track, as will be seen by reference to the engraving, is an ordinary bar of iron, such as may be purchased at any store, fastened to the face of the beam provided for the purpose. The fact that no special track is required, but that material sold in every hardware store can be utilized, is one of the special advantages to which the manufacturer directs attention.



Wilber's Barn-Door Hanger.

NEW PUBLICATIONS.

TRANSACTIONS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

Volume IV of the above transactions, giving a full account of the New York (1882) and Cleveland meetings of the Society, has been issued. It embraces 440 pages, and is replete with valuable and interesting matter relating to the various engineering topics discussed at those conventions.

HANDBOOK OF ELECTRIC TELEGRAPHY. By Thomas D. Lockwood. Size, 5 1/2 x 9 inches; 377 pages. Published by D. Van Nostrand. Price \$2.50.

A general knowledge of the theory of electricity and magnetism is a most desirable and valuable acquirement for all who are in any way connected with the practical application of either science. This, together with the fact that but few of the books written upon the subject are adapted for self-education, makes Mr. Lockwood's work specially valuable. It is arranged in the form of questions and answers, embracing 24 chapters, devoted to frictional, voltaic and thermo electricity, earth currents and earth batteries, electro-magnetism and electro-magnets, and the almost numberless details directly connected with the subject. The author has endeavored to put the information in as lucid and concise form as is consistent with accuracy, and to combine brevity with completeness. A lib-

eral use has been made of the electrical text-books and of the literature relating to kindred subjects, and also of the current electrical journals. Numerous illustrations add to the generally attractive character of the work, which, taken altogether, will very probably meet with extended popularity.

Mathieu Retorts at Vulcan, Mich.

DETROIT, MICH., February 16, 1884.

To the Editor of The Iron Age: My attention has been called to a statement in your issue of the 7th inst. reflecting upon the economical operations of the retorts constructed at the Vulcan Furnace, Michigan, under my patents. I have written the manager of the Vulcan Furnace Company, who is given as authority for the statements you publish, to know if such information was furnished by him, and when I return to Detroit I expect

to receive his answer, and I may, with your permission, communicate further with you. At present I think sufficient answer will be made to the statement by informing you that several days after the date on which the notice appeared the company operating the Vulcan Furnace made cash settlement with me for the use of my patents. Had there been any reasonable doubt as to their efficiency, the gentlemen who control the Vulcan Furnace Company would not have been willing to make settlement with me so promptly for the 56 retorts now in place, nor have contracted with me for the use of additional retorts in the future to an aggregate capacity of 240 cords per day.

J. A. MATHIEU.

TRADE PUBLICATIONS.

Fire-Brick.

The Troy Fire-Brick Works, of Troy, N. Y., Messrs. James Ostrander & Sons, proprietors, have sent us their catalogue of fire-brick, tiles, blast-furnace blocks, &c. The pamphlet, which is bound in flexible cloth cover, comprises some 24 pages, and is illustrated with cuts showing their different shaped bricks and blocks. During the last year this company have been making important additions to their works, including a new kiln of very large capacity. In the block department particular attention is paid to the manufacture of special and difficult shapes; they also endeavor to keep on hand a supply of special bricks, blocks and tiles used in the construction and repair of Siemens-Martin gas producers and regenerative furnaces. In blast-furnace work Messrs. Ostrander & Sons furnish linings in whole or in part for furnaces, from the smallest charcoal type to those of the largest and most approved anthracite class. The clay from which they manufacture their fire-brick is taken from their own mines at Woodbridge, N. J., which clay, they claim, ranks equal to the well-known Stourbridge clay, of England. Besides the many kinds of bricks they manufacture, this firm also receive orders for ground fire-clay, ground fire-brick and ground kaolin, the latter being used in the setting of stoves, ranges and heaters. The circular also contains tables in connection with the cuts, giving the various dimensions of the bricks.

Steam Engines and Mining Machinery.

We are in receipt of an illustrated catalogue from the Beckett & McDonald Manufacturing Company, of Arlington, N. J., builders of horizontal and vertical steam engines, hoisting engines, pumping engines, ore crushers and various other mine and mill machinery. This company build stationary engines of from 5 to 115 horse-power; besides these, their regular sizes, they are prepared to furnish, on special order, engines of greater power. Their automatic cut-off engines, which they make of from 25 to 125 horse-power, are illustrated with cuts giving a perspective view, besides a cut showing a sectional view of the steam-chest, illustrating the working of the Baxter patent piston-valve, which they employ. They make a number of hoisting engines, including the single-drum link motion and single-drum non-reversible, besides double-drum reversible and direct-acting hoisting engines. All the other special appliances connected with the crushing and concentrating of both gold and silver ore are very fully illustrated by sectional views, from which a good idea may be gained of the construction and working of the different machines. Tables are also given of the size and capacity of the machines, together with a price list of the same.

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Trenton Lock and Hardware Co., Trenton, N. J.
Peck, Stow & Wilcox Co., Southington, Ct., and Cleveland, Ohio.
Shurmer & Massey Mfg. Co., Cleveland, Ohio.

Elbell, Gilliam & Co., Canton, Ohio.
Livingston & Co., Pittsburgh, Pa.
James Smart Mfg. Co., Brockville, Canada.
Burrows, Stewart & Milne, Hamilton, Canada.
R. M. Wanzer & Co., Hamilton, Can.
Buffalo Hardware Co., Buffalo, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
E. & F. Fairbanks & Co., St. Johnsbury, Vt.
Buffalo Scale Co., Buffalo, N. Y.
Jos. Barnhurst, Philadelphia, Pa.
Van Wagoner & Williams, New York, and many others.



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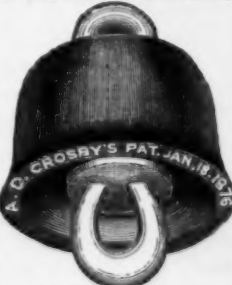
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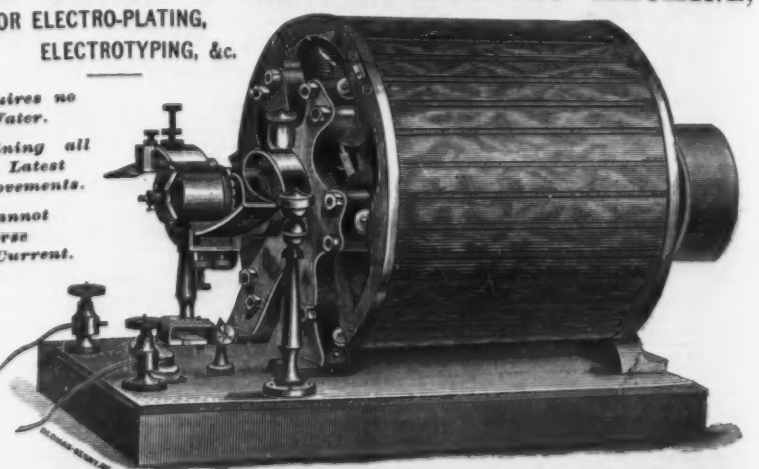
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THE AMERICAN DYNAMO-ELECTRIC MACHINE, FOR ELECTRO-PLATING, ELECTROTYPING, &c.

Requires no Water. Combining all the Latest Improvements. Cannot Reverse Current.

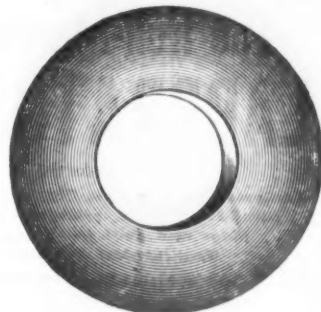


THE ZUCKER & LEVETT CHEMICAL CO., Gen'l Agts.

Manufacturers and Importers of NICKEL PLATING SUPPLIES, 538, 540, 542, 544 & 546 West 16th Street, - NEW YORK.

[illegible]

Paunches.
Belt of Drive, \$2.00; 2 1/2, 4.50; 3, 6.00; 3 1/2, 7.50; 4, 9.00; 4 1/2, 10.50; 5, 12.00; 5 1/2, 13.50; 6, 15.00; 6 1/2, 16.50; 7, 18.00; 7 1/2, 19.50; 8, 21.00; 8 1/2, 22.50; 9, 24.00; 9 1/2, 25.50; 10, 27.00; 10 1/2, 28.50; 11, 30.00; 11 1/2, 31.50; 12, 33.00; 12 1/2, 34.50; 13, 36.00; 13 1/2, 37.50; 14, 39.00; 14 1/2, 40.50; 15, 42.00; 15 1/2, 43.50; 16, 45.00; 16 1/2, 46.50; 17, 48.00; 17 1/2, 49.50; 18, 51.00; 18 1/2, 52.50; 19, 54.00; 19 1/2, 55.50; 20, 57.00; 20 1/2, 58.50; 21, 60.00; 21 1/2, 61.50; 22, 63.00; 22 1/2, 64.50; 23, 66.00; 23 1/2, 67.50; 24, 69.00; 24 1/2, 70.50; 25, 72.00; 25 1/2, 73.50; 26, 75.00; 26 1/2, 76.50; 27, 78.00; 27 1/2, 79.50; 28, 81.00; 28 1/2, 82.50; 29, 84.00; 29 1/2, 85.50; 30, 87.00; 30 1/2, 88.50; 31, 90.00; 31 1/2, 91.50; 32, 93.00; 32 1/2, 94.50; 33, 96.00; 33 1/2, 97.50; 34, 99.00; 34 1/2, 100.50; 35, 102.00; 35 1/2, 103.50; 36, 105.00; 36 1/2, 106.50; 37, 108.00; 37 1/2, 109.50; 38, 111.00; 38 1/2, 112.50; 39, 114.00; 39 1/2, 115.50; 40, 117.00; 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RHODE ISLAND TOOL CO.,

SUCCESSORS TO

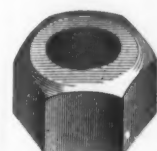
PROVIDENCE TOOL CO.,

MANUFACTURERS OF

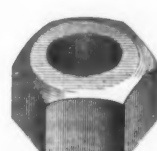
Heavy Hardware, Railroad and Machinists' Supplies,

SAIL MAKERS' AND SHIP CHANDLERS' HARDWARE,

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Square and Hexagon Nuts, Washers, Chain Links,



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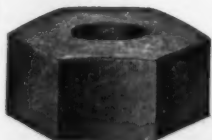
Sister Hooks, Open Thimbles, Grommets and Grommet Rings,

Grommet Knobs, Rigger Screws, Marline Spikes, Ship

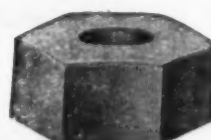
Scrapers, Norcross Iron Blocks, &c., &c.

DROP FORGINGS OF IRON OR STEEL MADE TO ORDER.

CORRESPONDENCE SOLICITED.



PROVIDENCE, R. I.



NINE REASONS WHY THE MUNCIE SKATE IS SUPERIOR TO ALL OTHERS.

- 1st. It is the only Adjustable-Bottom Skate manufactured.
- 2d. It can be changed from one size to another instantly.
- 3d. It is equal to four pairs of any other skate.
- 4th. It has met with greater success than all others combined.
- 5th. It is the most durable.
- 6th. It is the most simple.
- 7th. It can be made plain or scientific.
- 8th. It is the only practical Rink Skate in America.
- 9th. It is endorsed by the finest experts and professionals in the world as being the finest movement.



ADJUSTABLE BOTTOM.

MUNCIE IND.

THE ONLY PRACTICAL RINK SKATE
MANUFACTURED.

SEND FOR CIRCULARS AND PRICES.

TESTIMONIALS.

ROME, GA., Oct. 12, 1883.
MR. THAD. A. NEELY, Muncie, Ind.:—Dear Sir: I have been engaged in the Roller Skating business for eight years, and during that time have tried many different skates, but find the MUNCIE SKATE much superior to all others for general use.
Yours respectfully,
O. D. CHARLES.

NEW ORLEANS, LA., Oct. 27, 1883.
MR. THAD. A. NEELY, Muncie, Ind.: We have great pleasure in testifying to the merits of your MUNCIE

ROLLER SKATE. We have had ten years' experience in Roller Skating in many different countries, during which time we have seen and tested a hundred or more different patents. We have had your Skate in daily use now over two months, and have therefore given it a good, FAIR TRIAL, and can honestly assert it to be superior to any we have used before. We are, dear sir, yours faithfully,
LANE BROS. (English Professionals of London),
English Roller Skaters, with W. W. Cole's Circus, U. S. [America].

PRAIRIE DU CHIEN, WIS., Sept. 3, 1883.
THAD. A. NEELY, Muncie, Ind.: We have been using your MUNCIE ROLLER SKATE for the last three months, and have pleasure in stating that we consider it superior to any that we have previously seen or used, and we shall always recommend it as such.
Yours faithfully,
CHARLES & LILLY FLETCHER
(Fletcher's Trio of Skaters),
Russian Roller Skaters, with W. W. Cole's Circus.

THAD. A. NEELY'S
MUNCIE SKATE.
PATENTED.

WITHEROW & GORDON,
Engineers & Contractors,
PITTSBURGH, PA.

Agents for the
WHITWELL
HOT BLAST STOVES.
OVER 600 IN USE.

The following parties either have them in use or under construction.
Cedar Point Iron Co., N. Y.
Dunbar Furnace Co., Pa.
Crane Iron Co., Pa.
Pennsylvania Steel Co., Pa.
Neshannock Iron Co., Pa.
R. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
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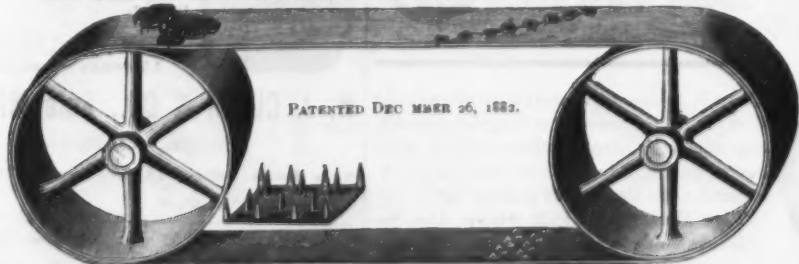
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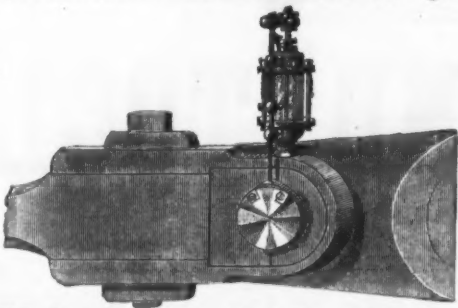
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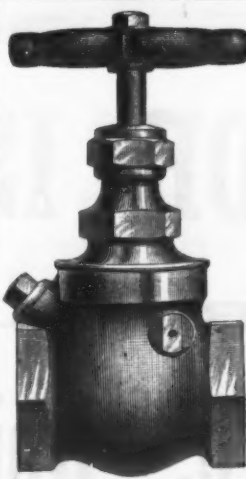
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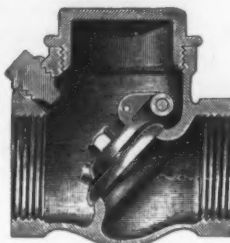
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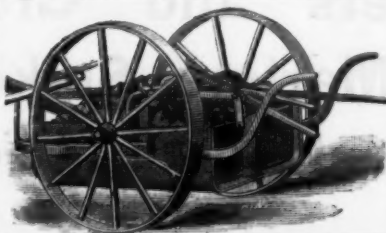
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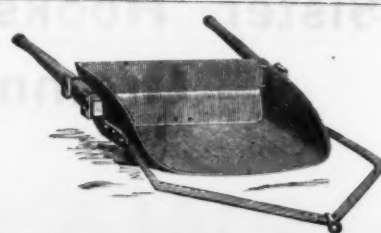
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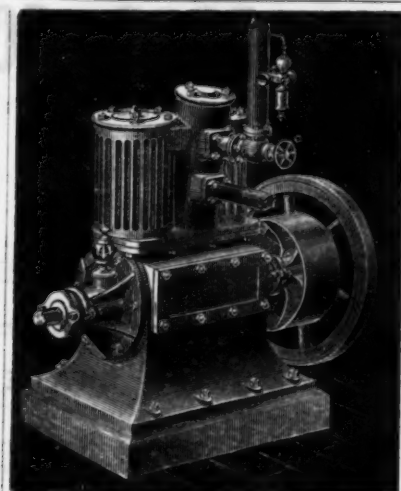
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We find the "Salem" to be first class in every respect.
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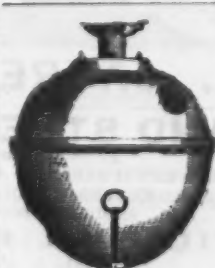
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It is nearer Perfection in every respect than any other Bucket made.

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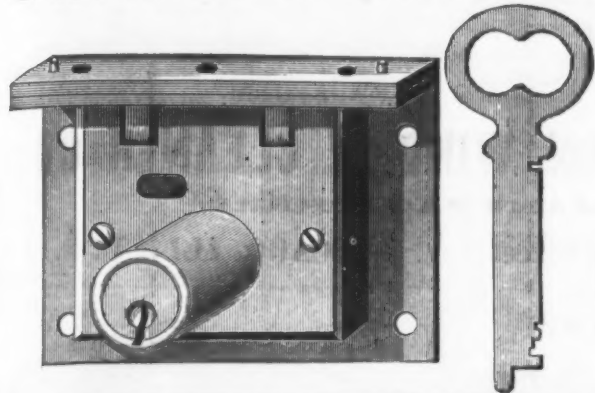
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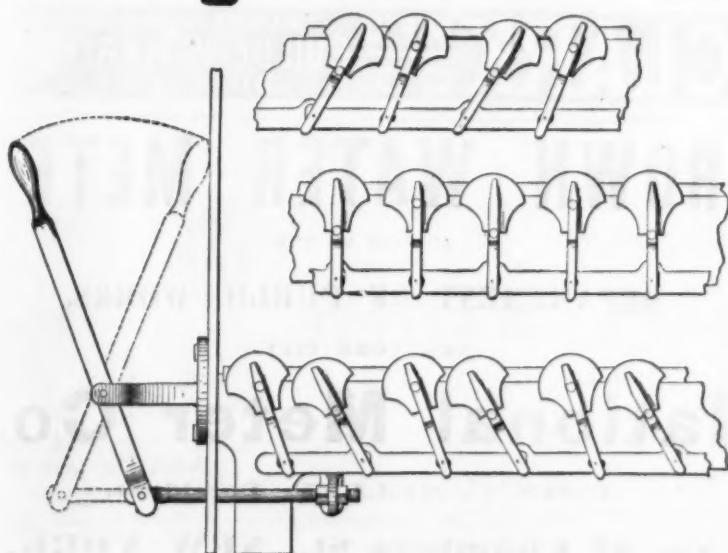


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THE BEST
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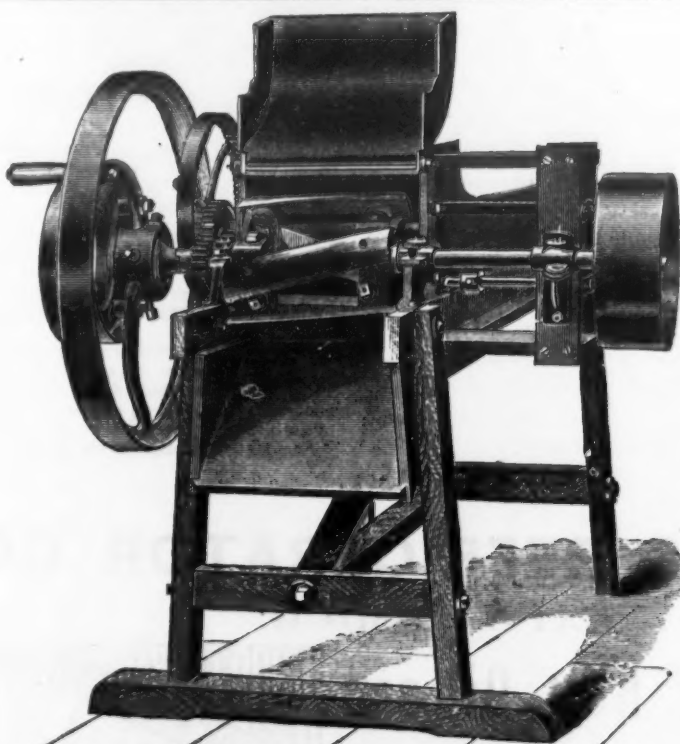
With Rubber-Cushioned Jaws,
Which Makes Saw-Filing
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NO. 1—(10 in. Jaw) per doz. \$15.00
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THE VERY BEST CUTTERS IN THE MARKET.

GUARANTEED TO GIVE PERFECT SATISFACTION.
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Perfect Safety Secured in Walking on Ice or Slippery Pavements.



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This Creeper has advantages over all others.

Its simplicity of construction, being easily adjusted, always ready for use, and when not needed
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SPECIALLY
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DOUBLE SHEAR STEEL
FOR
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OUR MAKE OF SHEAR STEEL IS SPECIALLY ADAPTED
TO MEET THE REQUIREMENTS OF CUTLERY MANUFACTURERS.

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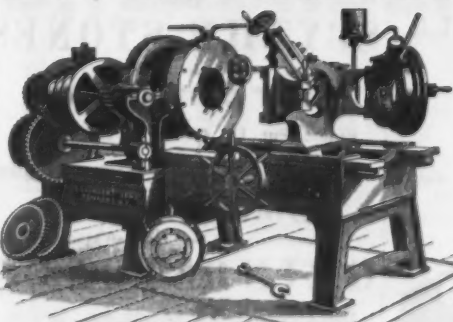
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For Pipe Mill and Steam
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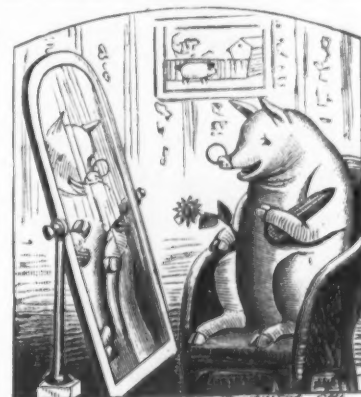
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Hog Ringers and Rings

will be no lower in price during the
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The Common Sense Sash Holder
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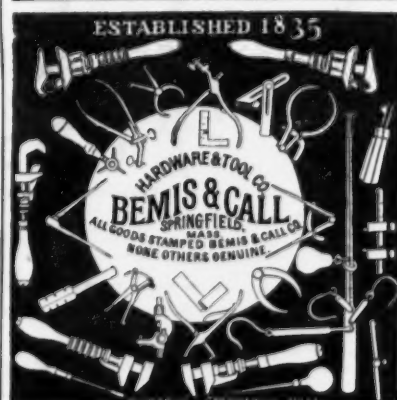
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any point, and it
the same when
down, and entirely
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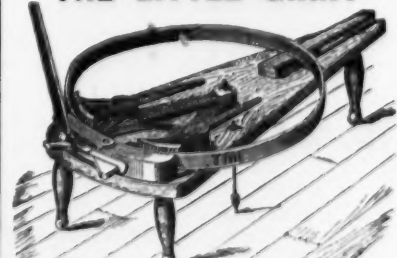
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Will work as well with hot
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THE JUSTICE HAMMER.

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Contracts Taken for Clearing Lands of Stumps.

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Style of No. 3.
PRICE LIST.

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ALSO Nos. 1, 2 and 3 with water tank.
Liberal discount to the trade.

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This advertisement appears but once, so you will need to write promptly if interested.



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Something New.

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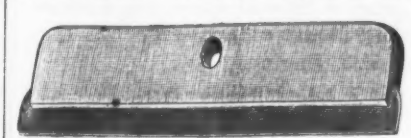
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Nos.	1	2	3	4	5	6
Size.	8	10	12	14	16	18 inches

PURE RUBBER.

Price, \$5.50 \$6.75 \$7.50 \$9 \$10.50 \$12 per doz.

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Discounts on Application.

PERFECTION WINDOW CLEANER.



SIMPLE,
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DURABLE.

STAPLE
AS
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Nos.	1	2	3	4	5	6
Size.	7	9	10	12	14	18 inches

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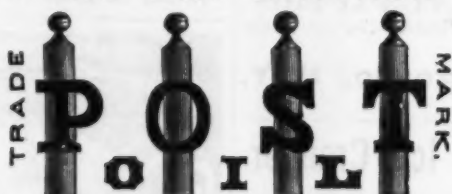
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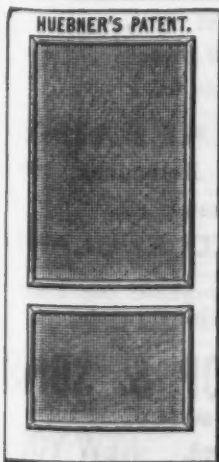


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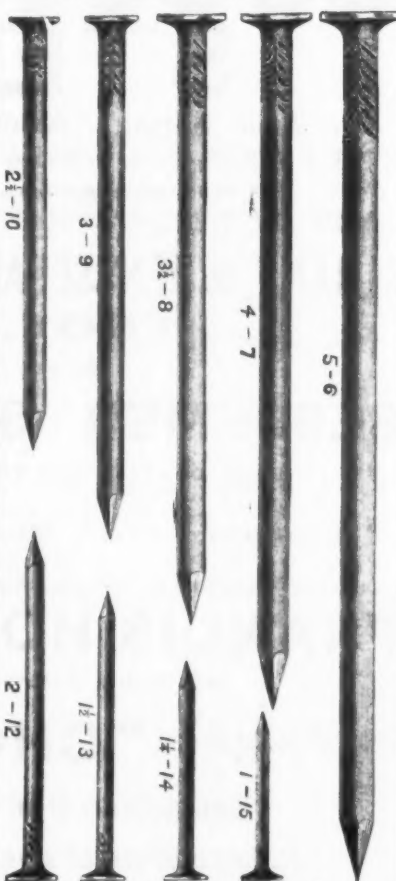
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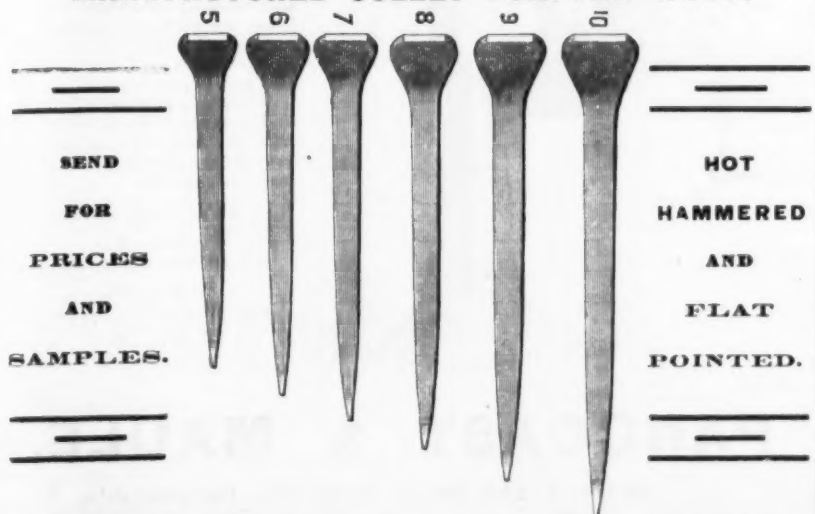
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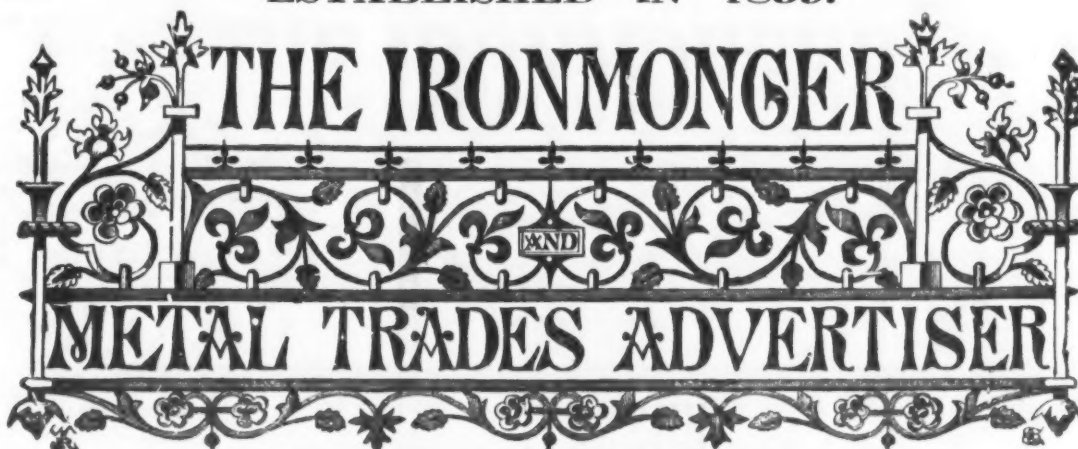
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The Lightest Four Pointed Barbed Wire in the Market.
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FITTED UP COMPLETE WITH USEFUL TOOLS.

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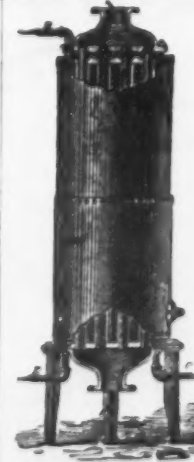
Also a full line of all the other styles of Tool Chests manufactured by them. Our New Illustrated Catalogue for Fall Season of 1883 will be issued about August 15th, and will be furnished on application, with prices. Every dealer in Hardware, Machinists' and Railway Supplies should keep a stock of these goods on hand at all times to supply the constant and increasing demand. We are the only company in the United States who make a business of manufacturing Tool Chests exclusively.

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 Heating and Purifying Water for
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Patented July 13 1877
Has Straight
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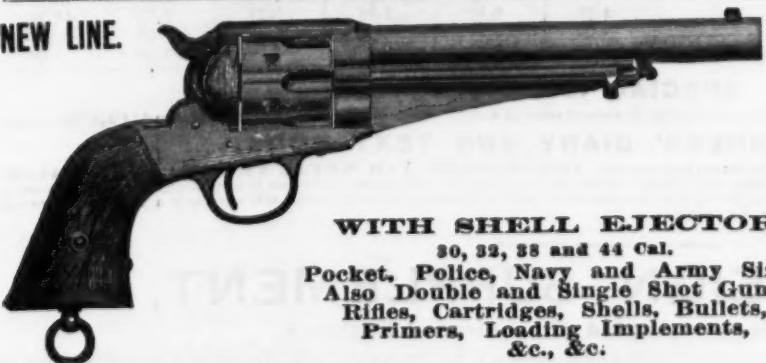
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Swivel Hooks for Rope or Chain,
POLISHED GROOVES, ALL SIZES IN STOCK.

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Improved Champion Dump
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Which is superior to the old method of using but one piece, for when that breaks the whole scraper
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It will throw a continuous jet from
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Especially attention is called to the
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ECLIPSE Hand Pipe-Cutting Machine

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While it is substantially built,
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which are superseding entirely the Tin Lamps
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We call your attention to and solicit your order
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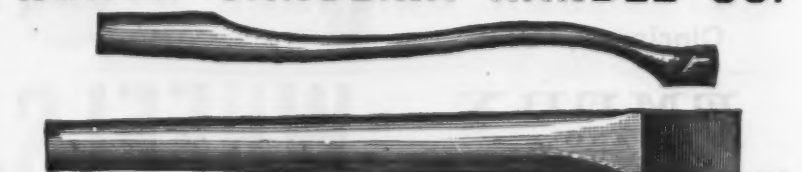


Sample sent if desired.

PRICE, \$12 PER DOZEN.

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ROOFING. Patent Cap Seam Roofing, in Four Styles. In Sheet
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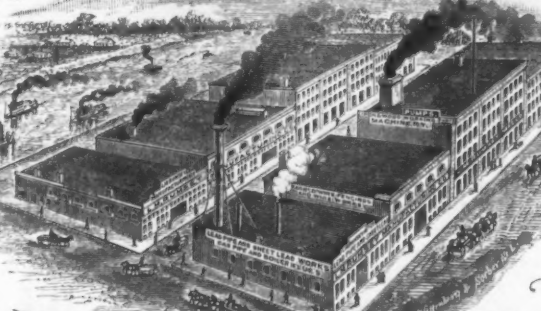
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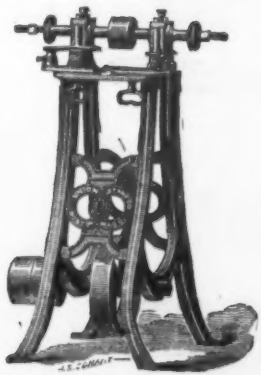
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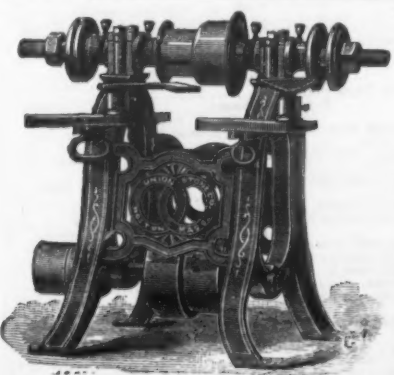
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CATALOGUE ON APPLICATION.



THE REIHER SELF-LOCKING TRANSMOM LIFTER

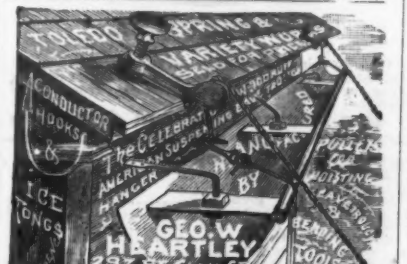
A represents the Stationary Locking Bar; B the Self-Locking Adjusting Block; C the Operating Rod; D the Lower Bracket; E the Lifting Arm; F the Transom Bracket.

With this Adjustable Locking Bar and Lifting Arm, the opening of the transom can be made larger or smaller without the least inconvenience.

Regular Sizes of Lifters for the Trade: 1/4 in., 5/16 in. and 3/8 in. Duplicates of Arm E, in different lengths, furnished with first order.

Catalogues furnished on application.

F. A. REIHER & CO.,
EXCLUSIVE MANUFACTURERS
Nos. 11 & 13 South Canal St.,
CHICAGO ILL.



Buttery.—Pocket American Shear Co.dis 40
Square Handle, Lap Bolster,dis 40
Square Handle, Lap Bolster,dis 40
Lap Bolster, Oval Handle,dis 40
Skinning,dis 40
Butcher, Common Round Handle, Wood's,dis 40
Shoe Knives, Wood's,dis 40

Dividers.—Cook's,dis 25
Dog Collars,dis 25
Door Springs.—Torrey's Rod,dis 40
Imitation Torrey's Rod,dis 40
Gem Coll. new list,dis 40
Crown,dis 40
Warner's,dis 40
Door Stops.—Thurston's,dis 40
Drawer Knobs.—Thurston's,dis 40
Morse Straight Shank,dis 40
Morse Bitt Stock,dis 40

Emery.—Wellington Mills,dis 40
Whipple Emery Mills,dis 40
Turkish in 10 B. cans,dis 40

Enamelled Ware.—
Standard Mfg. Co. Kettles,dis 40
Standard Sauce Pans,dis 40
Felloe Plates.—Wrought,dis 40
Felloe—American File Co.,dis 40
Nicholson File Co.,dis 40
Filing Machines.—Knox list, \$4.00,dis 40
Forks.—W. C. & Co. Manure,dis 40

Gimlet Bits.—
Genuine German, No. 12, 13 to 23, per doz \$1.00
Pierce's,dis 40
Glass Cutters.—Combination Glass Cutter and
Knife Sharpener,dis 40
Grub Hoes.—K. P. & Co.'s No. 2, \$1.50 per doz,dis 40
Hammer.—Maydole's,dis 40
Hartford Hammer Co.,dis 40
Hangers & Rollers.—Anti-Friction,dis 40
Acme Rollers,dis 40
Climax,dis 40
Common Hangers,dis 40
Common Rollers,dis 40

Hand Screws,dis 40
Hatchets.—C. F. Dowse new list,dis 40
Underhill,dis 40
Hay Knives.—Lightning,dis 40
Fisher's Patent,dis 40
Hinges.—Staple and T. (new list),dis 40
Providence Plate,dis 40
Wrought Screw Hook,dis 40
Hoes.—W. C. & Co.'s,dis 40
Hooks and Staples.—Brewers (new list),dis 40

Horse Nails,dis 40
National Finishes,dis 40
Putnam Pointed,dis 40
Bridgewater,dis 40
Ice Cream Freezers.—Packer's new list,dis 40
Knobs.—"Norwalk," New list,dis 40
Silver Glass Bell Pulls,dis 40
Silver Glass Bell Pulls,dis 40
Lanterns.—Tubular, No. 0,dis 40
Lawn Mowers.—The "Daisy,"dis 40
12 in. cut,dis 40
14 in. cut,dis 40
16 in. cut,dis 40
18 in. cut,dis 40

Lead Sheet,dis 40
Pipe,dis 40
Locks.—Norwalk,dis 40
Eagle Cabinet,dis 40
Eagle Trunk,dis 40
W. Wilcox & Co., Padlocks,dis 40
Manure Forks.—W. C. & Co.,dis 40
Mats,dis 40
K. P. & Co. Long Cutter, \$1.00 per doz,dis 40
K. P. & Co. Short Cutter, \$1.50 per doz,dis 40
K. P. & Co. Pick Cutter, \$1.00 per doz,dis 40
Measuring Tapes.—Eddy's,dis 40
Meat Cutters.—Miles' Challenge,dis 40
Hale's (new list),dis 40
American,dis 40
Money Drawers.—Tucker's Am.,dis 40
Mouse Traps.—Delusion,dis 40
Novelty,dis 40
Nails,dis 40
Oilers.—Zinc and Tin,dis 40
Brass and Copper,dis 40
Ox Hoes.—Extra finished and varnished,dis 40
14 in., 2 doz. pair, \$7.00 1/2 in., 2 doz. pair, \$7.00
16 in., 2 doz. pair, 9.00 1 3/4 in., 2 doz. pair, 12.00
Paper.—Tarred Sheathing,dis 40
Tarred Eagle Brand,dis 40

Picks.—H. P. & Co. Adze Eye, 5 to 8 \$12.00,dis 40
K. P. & Co. Adze Eye, 5 to 8 \$13.00,dis 40
Planes.—
Fancy Planes,dis 40
Razee Planes,dis 40
N. Y. Tool Co.,dis 40
English Iron,dis 40
Bailey's,dis 40
Plated Ware.—Rogers & Bro.,dis 40
Pliers.—Vom Cleft & Co.'s,dis 40
Butter's Wire Pliers,dis 40
Plumb & Levels.—Stanley R. & L. Co.,dis 40
Pocket Knives.—American Shear Co.,dis 40
Potato Dispersers.—W. C. & Co. reduced list,dis 40
Rulers.—Acme or Excelsior, 18 in.,dis 40
Acme or Excelsior, 24 in.,dis 40
Pulley Blocks,dis 40
Pumps.—Union Manufacturing Co.,dis 40
Iron Clatern,dis 40
Iron Fitcher Spout,dis 40
Copper,dis 40
Rivets.—Black (new list),dis 40
Carriage in 10 B. papers (new list),dis 40
Copper,dis 40
Razors.—Torrey's,dis 40
Pliers.—Stanley, Boxwood,dis 40
Stanley, Ivory,dis 40

Sad Irons.—Common,dis 40
Tailors' Goggles,dis 40
Enterprises, "Potts,"dis 40
Sash Locks.—King & Hutchinson's, new list,dis 40
Sandpaper.—Baader & Adamson,dis 40
M. B. & D.,dis 40
Sash Weights.—Patent Eye,dis 40
Saws.—Hand Saws, Dismantled,dis 40
Cross Cut Saws,dis 40
Dismantled's Common Tooth,dis 40
Dismantled's G. at American Tooth,dis 40
Boytan's G. at Lining Tooth,dis 40
M. B. & D. H. Saws,dis 40
W. M. & Co.'s Cl. at Saws,dis 40
Richardson Bros.,dis 40
Saw Blades.—Dismantled,dis 40
W. M. & Co.,dis 40
W. B. & Co.,dis 40
Welch & Griffith, Extra,dis 40
Scales.—Fairbanks,dis 40

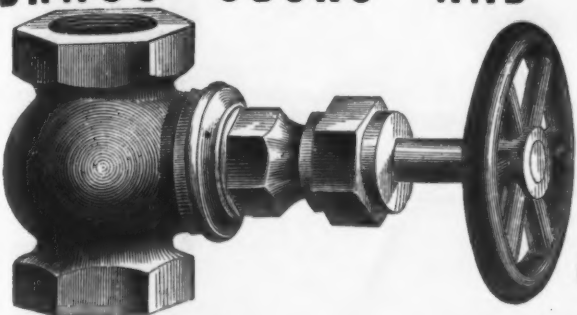
Screws.—
American Flat-Head Iron,dis 40
American Flat-Head Iron,dis 40
American Round-Head Iron,dis 40
American Round-Head Iron,dis 40
Grillier Round Head Nickel-Plated Common,dis 40
Seynes.—Chippers, in boxes,dis 40
Shavers.—Kimball's,dis 40
Watrous,dis 40
Shears.—American Shear Co. new list,dis 40
Shot.—Tatham's,dis 40
Shovels.—O. Ames new list,dis 40
O. Ames, other brands, new list,dis 40
M. B. & D. H. Saws,dis 40
Sinks.—Marce Patent,dis 40
Snow Shovels,dis 40
Shovels.—Union,dis 40
Acme,dis 40
Imperial Club list No. 1, \$3.75 per pair list no. 7, \$4.00 per pair,dis 40
Stocks and Dies.—King's,dis 40

Tacks.—
Swedes Tinned,dis 40
Gimp and Lace,dis 40
Copper Tacks,dis 40
All balances on list,dis 40
Trans.—Onida, Genuine,dis 40
Onida, Imitation, H. & N.,dis 40
Vices.—Simpson's Adjustable,dis 40
Howard Vice Co.,dis 40
Prentiss',dis 40
Weather Strips.—Packer's,dis 40
Brown's Flexible Rubber,dis 40
In 25 foot boxes: No. 1, 1 1/2 in. wide, \$4.00, No. 2, 2 in. wide, \$4.00, No. 3, 2 1/2 in. wide, \$4.00, No. 4, 3 in. wide, \$4.00, No. 5, 3 1/2 in. wide, \$4.00, No. 6, 4 in. wide, \$4.00, No. 7, 4 1/2 in. wide, \$4.00, No. 8, 5 in. wide, \$4.00, No. 9, 5 1/2 in. wide, \$4.00, No. 10, 6 in. wide, \$4.00, No. 11, 6 1/2 in. wide, \$4.00, No. 12, 7 in. wide, \$4.00, No. 13, 7 1/2 in. wide, \$4.00, No. 14, 8 in. wide, \$4.00, No. 15, 8 1/2 in. wide, \$4.00, No. 16, 9 in. wide, \$4.00, No. 17, 9 1/2 in. wide, \$4.00, No. 18, 10 in. wide, \$4.00, No. 19, 10 1/2 in. wide, \$4.00, No. 20, 11 in. wide, \$4.00, No. 21, 11 1/2 in. wide, \$4.00, No. 22, 12 in. wide, \$4.00, No. 23, 12 1/2 in. wide, \$4.00, No. 24, 13 in. wide, \$4.00, No. 25, 13 1/2 in. wide, \$4.00, No. 26, 14 in. wide, \$4.00, No. 27, 14 1/2 in. wide, \$4.00, No. 28, 15 in. wide, \$4.00, No. 29, 15 1/2 in. wide, \$4.00, No. 30, 16 in. wide, \$4.00, No. 31, 16 1/2 in. wide, \$4.00, No. 32, 17 in. wide, \$4.00, No. 33, 17 1/2 in. wide, \$4.00, No. 34, 18 in. wide, \$4.00, No. 35, 18 1/2 in. wide, \$4.00, No. 36, 19 in. wide, \$4.00, No. 37, 19 1/2 in. wide, \$4.00, No. 38, 20 in. wide, \$4.00, No. 39, 20 1/2 in. wide, \$4.00, No. 40, 21 in. wide, \$4.00, No. 41, 21 1/2 in. wide, \$4.00, No. 42, 22 in. wide, \$4.00, No. 43, 22 1/2 in. wide, \$4.00, No. 44, 23 in. wide, \$4.00, No. 45, 23 1/2 in. wide, \$4.00, No. 46, 24 in. wide, \$4.00, No. 47, 24 1/2 in. wide, \$4.00, No. 48, 25 in. wide, \$4.00, No. 49, 25 1/2 in. wide, \$4.00, No. 50, 26 in. wide, \$4.00, No. 51, 26 1/2 in. wide, \$4.00, No. 52, 27 in. wide, \$4.00, No. 53, 27 1/2 in. wide, \$4.00, No. 54, 28 in. wide, \$4.00, No. 55, 28 1/2 in. wide, \$4.00, No. 56, 29 in. wide, \$4.00, No. 57, 29 1/2 in. wide, \$4.00, No. 58, 30 in. wide, \$4.00, No. 59, 30 1/2 in. wide, \$4.00, No. 60, 31 in. wide, \$4.00, No. 61, 31 1/2 in. wide, \$4.00, No. 62, 32 in. wide, \$4.00, No. 63, 32 1/2 in. wide, \$4.00, No. 64, 33 in. wide, \$4.00, No. 65, 33 1/2 in. 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\$4.00, No. 98, 50 in. wide, \$4.00, No. 99, 50 1/2 in. wide, \$4.00, No. 100, 51 in. wide, \$4.00, No. 101, 51 1/2 in. wide, \$4.00, No. 102, 52 in. wide, \$4.00, No. 103, 52 1/2 in. wide, \$4.00, No. 104, 53 in. wide, \$4.00, No. 105, 53 1/2 in. wide, \$4.00, No. 106, 54 in. wide, \$4.00, No. 107, 54 1/2 in. wide, \$4.00, No. 108, 55 in. wide, \$4.00, No. 109, 55 1/2 in. wide, \$4.00, No. 110, 56 in. wide, \$4.00, No. 111, 56 1/2 in. wide, \$4.00, No. 112, 57 in. wide, \$4.00, No. 113, 57 1/2 in. wide, \$4.00, No. 114, 58 in. wide, \$4.00, No. 115, 58 1/2 in. wide, \$4.00, No. 116, 59 in. wide, \$4.00, No. 117, 59 1/2 in. wide, \$4.00, No. 118, 60 in. wide, \$4.00, No. 119, 60 1/2 in. wide, \$4.00, No. 120, 61 in. wide, \$4.00, No. 121, 61 1/2 in. wide, \$4.00, No. 122, 62 in. wide, \$4.00, No. 123, 62 1/2 in. wide, \$4.00, No. 124, 63 in. wide, \$4.00, No. 125, 63 1/2 in. wide, \$4.00, No. 126, 64 in. wide, \$4.00, No. 127, 64 1/2 in. wide, \$4.00, No. 128, 65 in. wide, \$4.00, No. 129, 65 1/2 in. wide, \$4.00, No. 130, 66 in. wide, \$4.00, No. 131, 66 1/2 in. wide, \$4.00, No. 132, 67 in. wide, \$4.00, No. 133, 67 1/2 in. wide, \$4.00, No. 134, 68 in. wide, \$4.00, No. 135, 68 1/2 in. wide, \$4.00, No. 136, 69 in. wide, \$4.00, No. 137, 69 1/2 in. wide, \$4.00, No. 138, 70 in. wide, \$4.00, No. 139, 70 1/2 in. wide, \$4.00, No. 140, 71 in. wide, \$4.00, No. 141, 71 1/2 in. wide, \$4.00, No. 142, 72 in. wide, \$4.00, No. 143, 72 1/2 in. wide, \$4.00, No. 144, 73 in. wide, \$4.00, No. 145, 73 1/2 in. wide, \$4.00, No. 146, 74 in. wide, \$4.00, No. 147, 74 1/2 in. wide, \$4.00, No. 148, 75 in. wide, \$4.00, No. 149, 75 1/2 in. wide, \$4.00, No. 150, 76 in. wide, \$4.00, No. 151, 76 1/2 in. wide, \$4.00, No. 152, 77 in. wide, \$4.00, No. 153, 77 1/2 in. wide, \$4.00, No. 154, 78 in. wide, \$4.00, No. 155, 78 1/2 in. wide, \$4.00, No. 156, 79 in. wide, \$4.00, No. 157, 79 1/2 in. wide, \$4.00, No. 158, 80 in. wide, \$4.00, No. 159, 80 1/2 in. wide, \$4.00, No. 160, 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wide, \$4.00, No. 192, 97 in. wide, \$4.00, No. 193, 97 1/2 in. wide, \$4.00, No. 194, 98 in. wide, \$4.00, No. 195, 98 1/2 in. wide, \$4.00, No. 196, 99 in. wide, \$4.00, No. 197, 99 1/2 in. wide, \$4.00, No. 198, 100 in. wide, \$4.00, No. 199, 100 1/2 in. wide, \$4.00, No. 200, 101 in. wide, \$4.00, No. 201, 101 1/2 in. wide, \$4.00, No. 202, 102 in. wide, \$4.00, No. 203, 102 1/2 in. wide, \$4.00, No. 204, 103 in. wide, \$4.00, No. 205, 103 1/2 in. wide, \$4.00, No. 206, 104 in. wide, \$4.00, No. 207, 104 1/2 in. wide, \$4.00, No. 208, 105 in. wide, \$4.00, No. 209, 105 1/2 in. wide, \$4.00, No. 210, 106 in. wide, \$4.00, No. 211, 106 1/2 in. wide, \$4.00, No. 212, 107 in. wide, \$4.00, No. 213, 107 1/2 in. wide, \$4.00, No. 214, 108 in. wide, \$4.00, No. 215, 108 1/2 in. wide, \$4.00, No. 216, 109 in. wide, \$4.00, No. 217, 109 1/2 in. wide, \$4.00, No. 218, 110 in. wide, \$4.00, No. 219, 110 1/2 in. wide, \$4.00, No. 220, 111 in. wide, \$4.00, No. 221, 111 1/2 in. wide, \$4.00, No. 222, 112 in. wide, \$4.00, No. 223, 112 1/2 in. wide, \$4.00, No. 224, 113 in. wide, \$4.00, No. 225, 113 1/2 in. wide, \$4.00, No. 226, 114 in. wide, \$4.00, No. 227, 114 1/2 in. wide, \$4.00, No. 228, 115 in. wide, \$4.00, No. 229, 115 1/2 in. wide, \$4.00, No. 230, 116 in. wide, \$4.00, No. 231, 116 1/2 in. wide, \$4.00, No. 232, 117 in. wide, \$4.00, No. 233, 117 1/2 in. wide, \$4.00, No. 234, 118 in. wide, \$4.00, No. 235, 118 1/2 in. wide, \$4.00, No. 236, 119 in. wide, \$4.00, No. 237, 119 1/2 in. wide, \$4.00, No. 238, 120 in. wide, \$4.00, No. 239, 120 1/2 in. wide, \$4.00, No. 240, 121 in. wide, \$4.00, No. 241, 121 1/2 in. wide, \$4.00, No. 242, 122 in. wide, \$4.00, No. 243, 122 1/2 in. wide, \$4.00, No. 244, 123 in. wide, \$4.00, No. 245, 123 1/2 in. wide, \$4.00, No. 246, 124 in. wide, \$4.00, No. 247, 124 1/2 in. wide, \$4.00, No. 248, 125 in. wide, \$4.00, No. 249, 125 1/2 in. wide, \$4.00, No. 250, 126 in. wide, \$4.00, No. 251, 126 1/2 in. wide, \$4.00, No. 252, 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wide, \$4.00, No. 283, 142 1/2 in. wide, \$4.00, No. 284, 143 in. wide, \$4.00, No. 285, 143 1/2 in. wide, \$4.00, No. 286, 144 in. wide, \$4.00, No. 287, 144 1/2 in. wide, \$4.00, No. 288, 145 in. wide, \$4.00, No. 289, 145 1/2 in. wide, \$4.00, No. 290, 146 in. wide, \$4.00, No. 291, 146 1/2 in. wide, \$4.00, No. 292, 147 in. wide, \$4.00, No. 293, 147 1/2 in. wide, \$4.00, No. 294, 148 in. wide, \$4.00, No. 295, 148 1/2 in. wide, \$4.00, No. 296, 149 in. wide, \$4.00, No. 297, 149 1/2 in. wide, \$4.00, No. 298, 150 in. wide, \$4.00, No. 299, 150 1/2 in. wide, \$4.00, No. 300, 151 in. wide, \$4.00, No. 301, 151 1/2 in. wide, \$4.00, No. 302, 152 in. wide, \$4.00, No. 303, 152 1/2 in. wide, \$4.00, No. 304, 153 in. wide, \$4.00, No. 305, 153 1/2 in. wide, \$4.00, No. 306, 154 in. wide, \$4.00, No. 307, 154 1/2 in. wide, \$4.00, No. 308, 155 in. wide, \$4.00, No. 309, 155 1/2 in. wide, \$4.00, No. 310, 156 in. wide, \$4.00, No. 311, 156 1/2 in. wide, \$4.00, No. 312, 157 in. wide, \$4.00, No. 313, 157 1/2 in. wide, \$4.00, No. 314, 158 in. wide, \$4.00, No. 315, 158 1/2 in. wide, \$4.00, No. 316, 159 in. wide, \$4.00, No. 317, 159 1/2 in. wide, \$4.00, No. 318, 160 in. wide, \$4.00, No. 319, 160 1/2 in. wide, \$4.00, No. 320, 161 in. wide, \$4.00, No. 321, 161 1/2 in. wide, \$4.00, No. 322, 162 in. wide, \$4.00, No. 323, 162 1/2 in. wide, \$4.00, No. 324, 163 in. wide, \$4.00, No. 325, 163 1/2 in. wide, \$4.00, No. 326, 164 in. wide, \$4.00, No. 327, 164 1/2 in. wide, \$4.00, No. 328, 165 in. wide, \$4.00, No. 329, 165 1/2 in. wide, \$4.00, No. 330, 166 in. wide, \$4.00, No. 331, 166 1/2 in. wide, \$4.00, No. 332, 167 in. wide, \$4.00, No. 333, 167 1/2 in. wide, \$4.00, No. 334, 168 in. wide, \$4.00, No. 335, 168 1/2 in. wide, \$4.00, No. 336, 169 in. wide, \$4.00, No. 337, 169 1/2 in. wide, \$4.00, No. 338, 170 in. wide, \$4.00, No. 339, 170 1/2 in. wide, \$4.00, No. 340, 171 in. wide, \$4.00, No. 341, 171 1/2 in. wide, \$4.00, No. 342, 172 in. wide, \$4.00, 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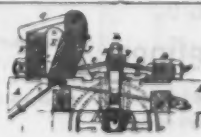
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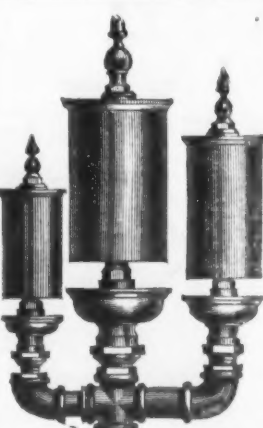
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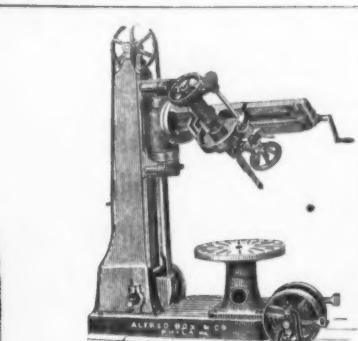
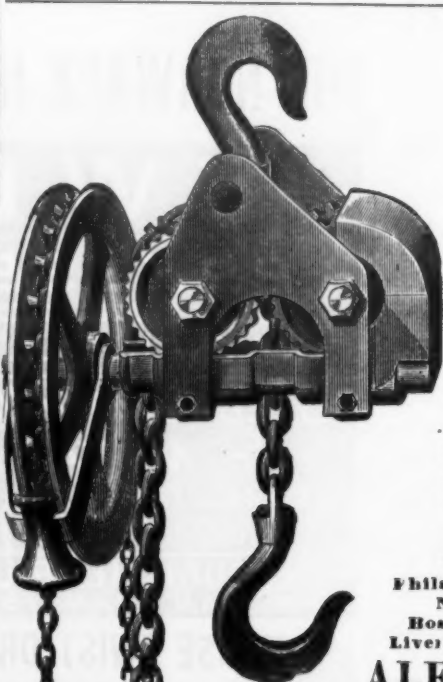
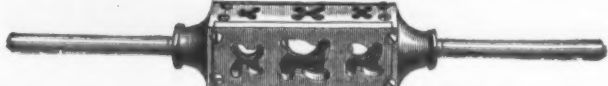
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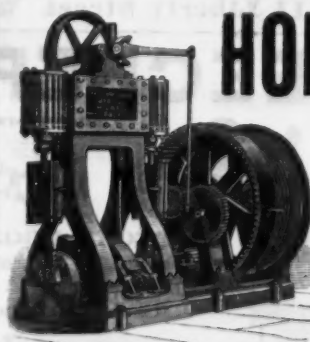
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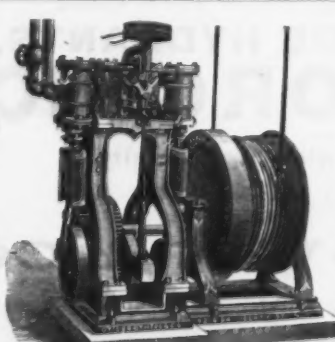
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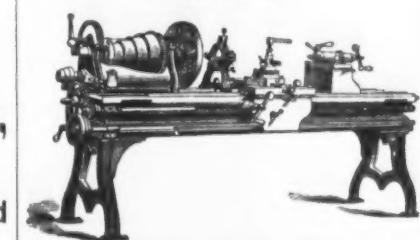
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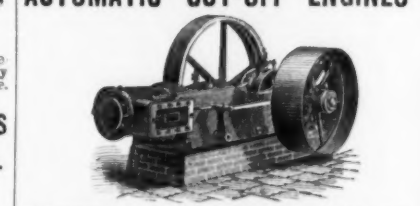
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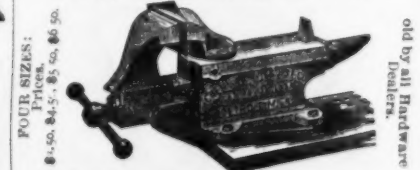


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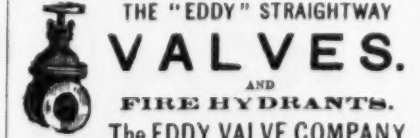
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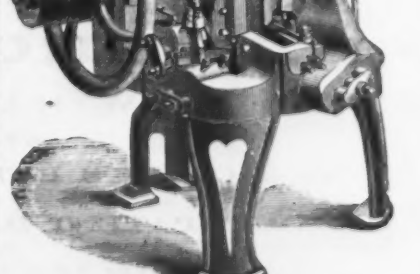
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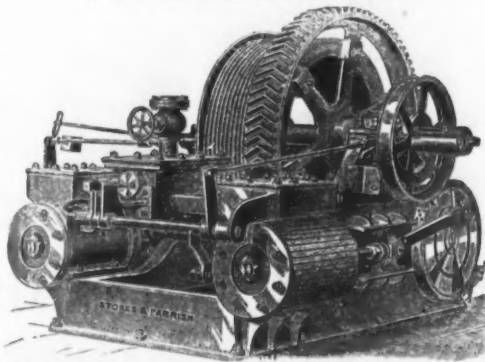
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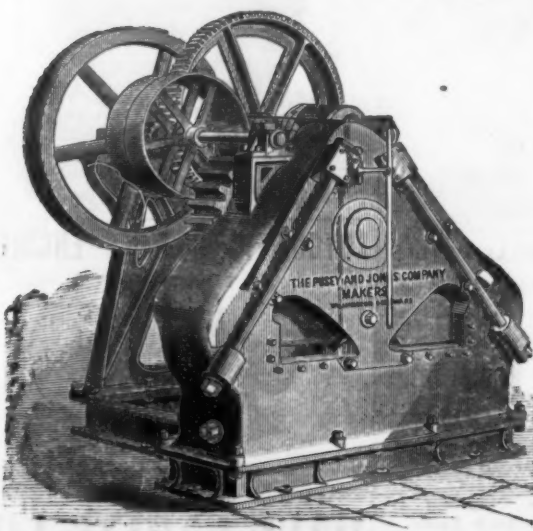
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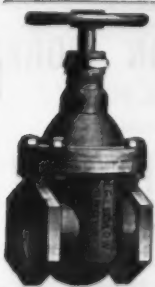
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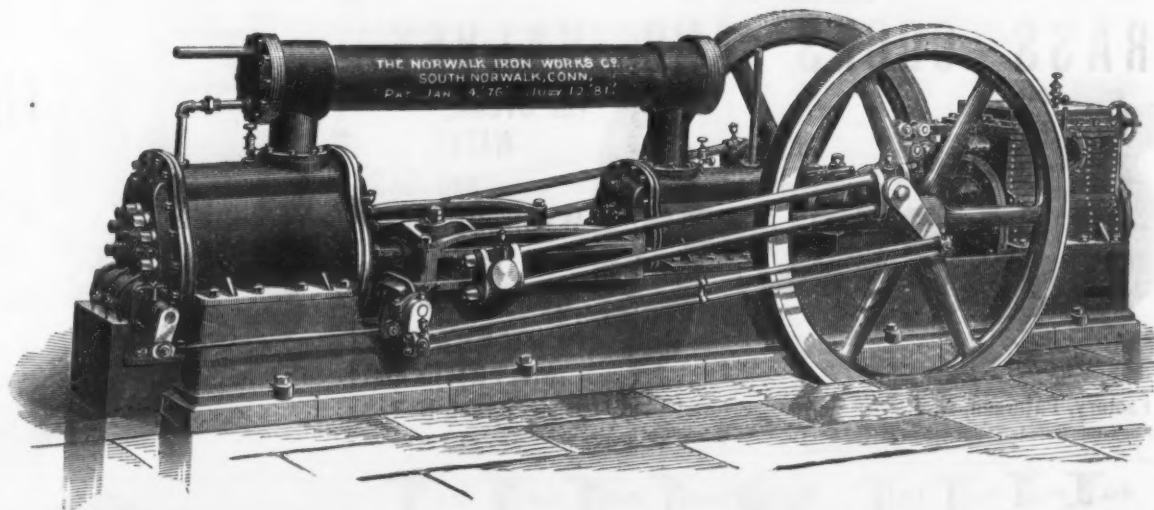
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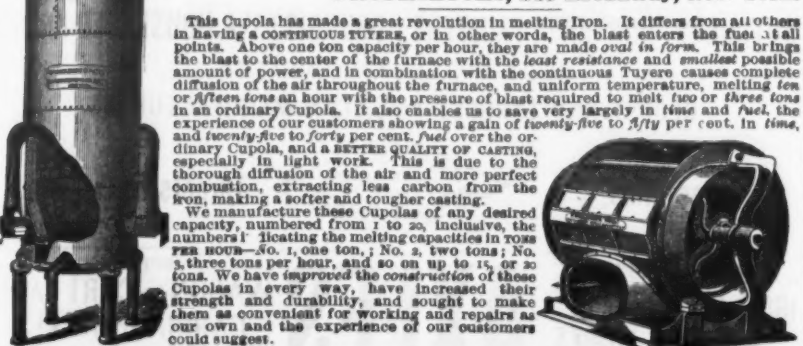
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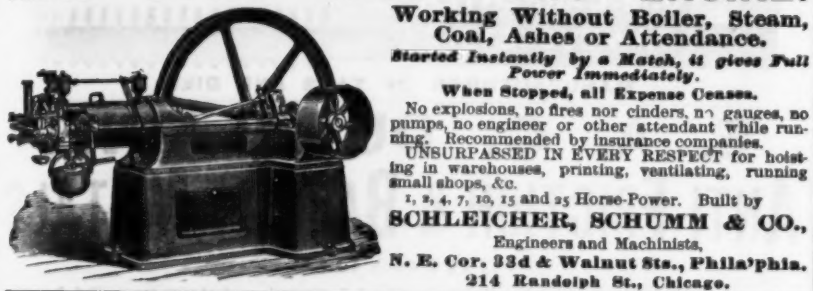
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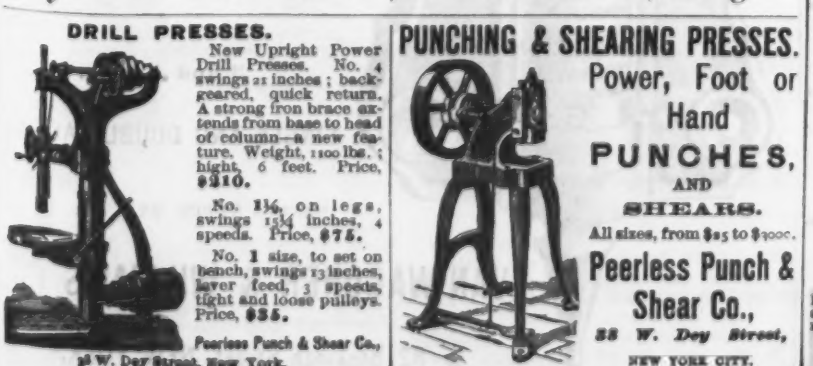
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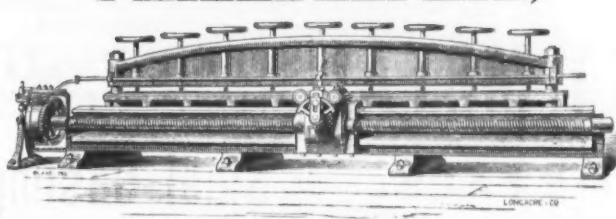


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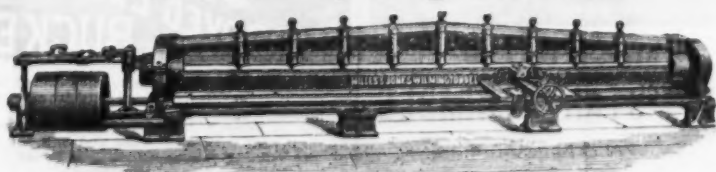
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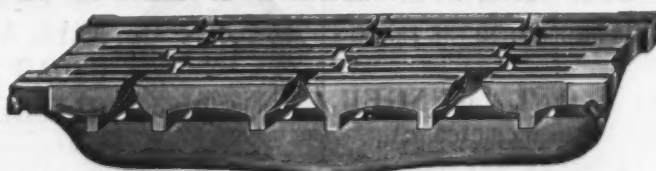
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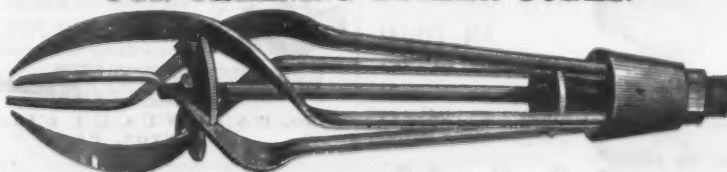
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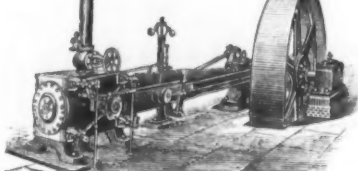


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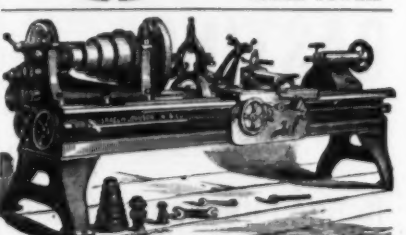
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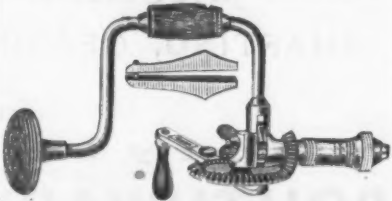
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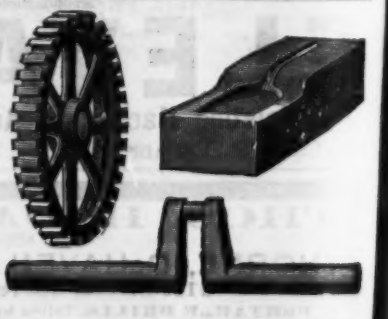
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